Others

PO-01

The growth inhibition of breast cancer cells by Hibiscus Taiwanensis extracts

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Introduction

Epidemiological studies have indicated that breast cancer is one of the leading cancer of death in Taiwan. At patient, surgical therapy and chemotherapy are the major strategies for the cure of breast cancer. The chemotherapeutic drugs are usually designed to induce cancer cell death via cell cycle arrest and/or apoptosis pathways. In this study, we used a extracts of Hibiscus Taiwanensis to inhibit breast cancer cell proliferation and tumor growth, and investigate the underlying molecular mechanisms.

Conclusion

These results suggest that Hibiscus Taiwanensis extracts could inhibit human breast cancer cell proliferation and tumor growth, and might be a potential drug for chemotherapy.

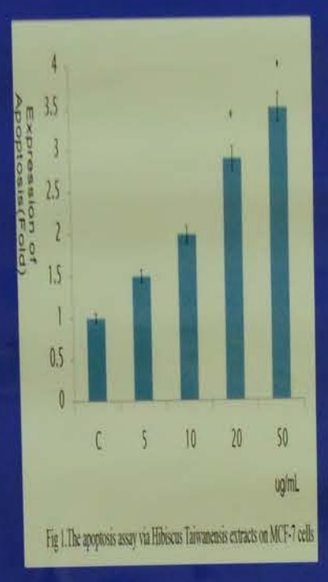

Fig 1.The apoptosis assay via Hibiscus Taiwanensis extracts on MCF-7 cells

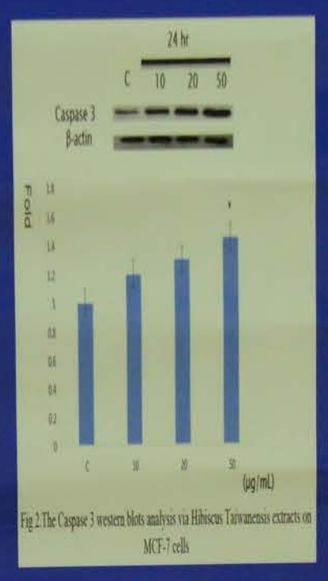

Fig 2.The Caspase 3 western blots analysis via Hibiscus Taiwanensis extracts on MCF-7 cells

Materials and Methods

In this study, we used Hibiscus Taiwanensis extracts to inhibit breast cancer cell proliferation and tumor growth, and investigate the underlying molecular mechanisms. Human breast cancer cell lines (MCF-7) was used in this study. Cell cycles were analyzed by Flow cytometry. Signal transductions were analyzed by western blots in this study.

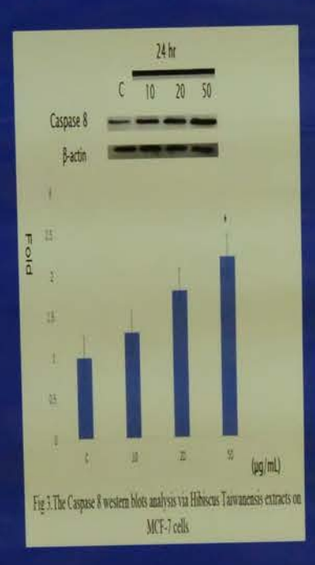

Fig 3.The Caspase 8 western blots analysis via Hibiscus Taiwanensis extracts on MCF-7 cells

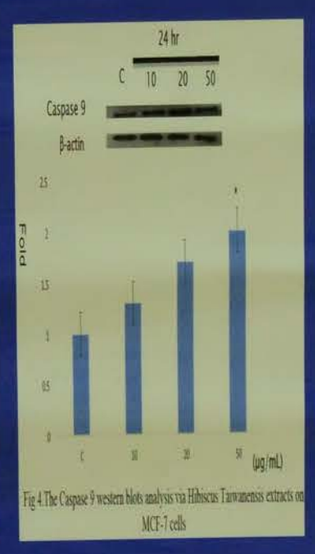

Fig 4.The Caspase 9 western blots analysis via Hibiscus Taiwanensis extracts on MCF-7 cells

Results

The results indicated that Hibiscus Taiwanensis extracts significantly decreased cell proliferation by a dose-dependent manner in cells. Flow-cytometry demonstrated that Hibiscus Taiwanensis extracts induced cell cycle arrest at G0/G1 phase. When analysis the expression of cell cycle-related proteins, we found that Hibiscus Taiwanensis extracts increased caspase3/8/9, Parp and cyt-C in a dose-dependent manner.

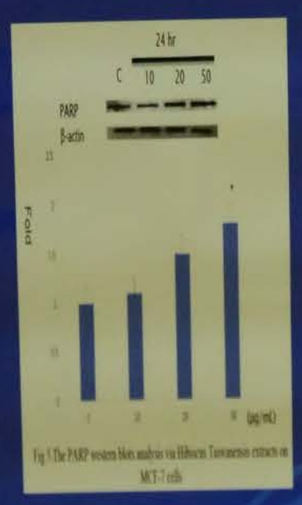

Fig 5.The PARP western blots analysis via Hibiscus Taiwanensis extracts on MCF-7 cells

Fig 6.The Cyt-C western blots via Hibiscus Taiwanensis extracts on MCF-7 cells

Others

PO-02

The modulation of signal transduction pathway by complex Chinese herbs extracts in human prostate cancer cell

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Introduction

Surgical therapy and chemotherapy are the major strategies for the cure of prostate cancer. The chemotherapeutic drugs are usually designed to induce cancer cell death via cell cycle arrest and/or apoptosis pathways. In this study, we used extracts of complex Chinese herbs extracts to inhibit prostate cancer cell (LNCaP) proliferation and tumor growth, and investigate the underlying molecular mechanisms.

Materials and Methods

In this study, we used complex Chinese herbs extracts to inhibit prostate cancer cell proliferation and tumor growth, and investigate the underlying molecular mechanisms. Human prostate cancer cell lines (LNCaP) was used in this study. Cell cycles were analyzed by Flow cytometry. Signal transductions were analyzed by western blots in this study.

Results

The results indicated that complex Chinese herbs extracts significantly decreased cell proliferation by a dose-dependent manner in cells. Flow cytometry demonstrated that complex Chinese herbs extracts induced cell cycle arrest at G2/M phase. When analysis the expression of cell cycle-related proteins, we found that complex Chinese herbs extracts decreased ERK1/2 and increased p38MAPkinase in a dose-dependent manner.

Conclusion

These results suggest that complex Chinese herbs extracts could inhibit human prostate cancer cell proliferation and tumor growth, and might be a potential drug for chemotherapy.

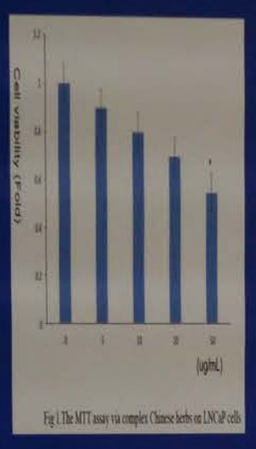

Fig 1.The MTT assay via complex Chinese herbs on LNCaP cells

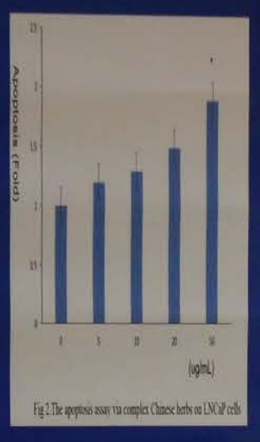

Fig 2.The apoptosis assay via complex Chinese herbs on LNCaP cells

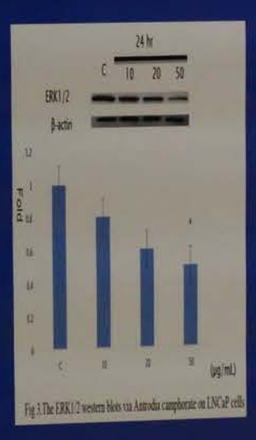

Fig 3.The ERK1/2 western blots via Antrodia camphorate on LNCaP cells

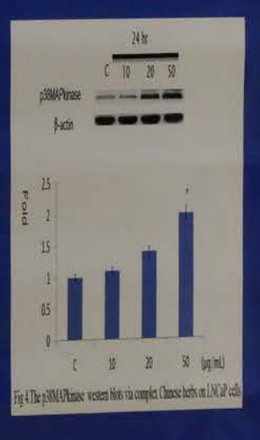

Fig 4.The p38MAPkinase western blots via complex Chinese herbs on LNCaP cells

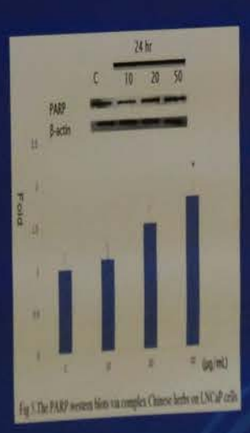

Fig 5.The PARP western blots via complex Chinese herbs on LNCaP cells

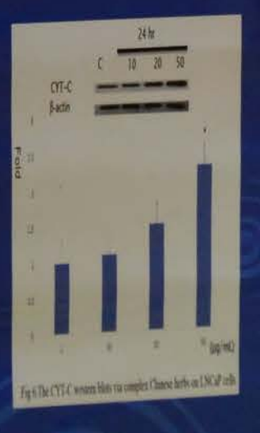

Fig 6.The CYT-C western blots via complex Chinese herbs on LNCaP cells

Others

PO-03

Anti-proliferation, an apoptosis and anti-metastasis of sanguinarine in human lung adenocarcinoma cells

Ming-Der Shi[1], Yuan-Wei Shih[2]

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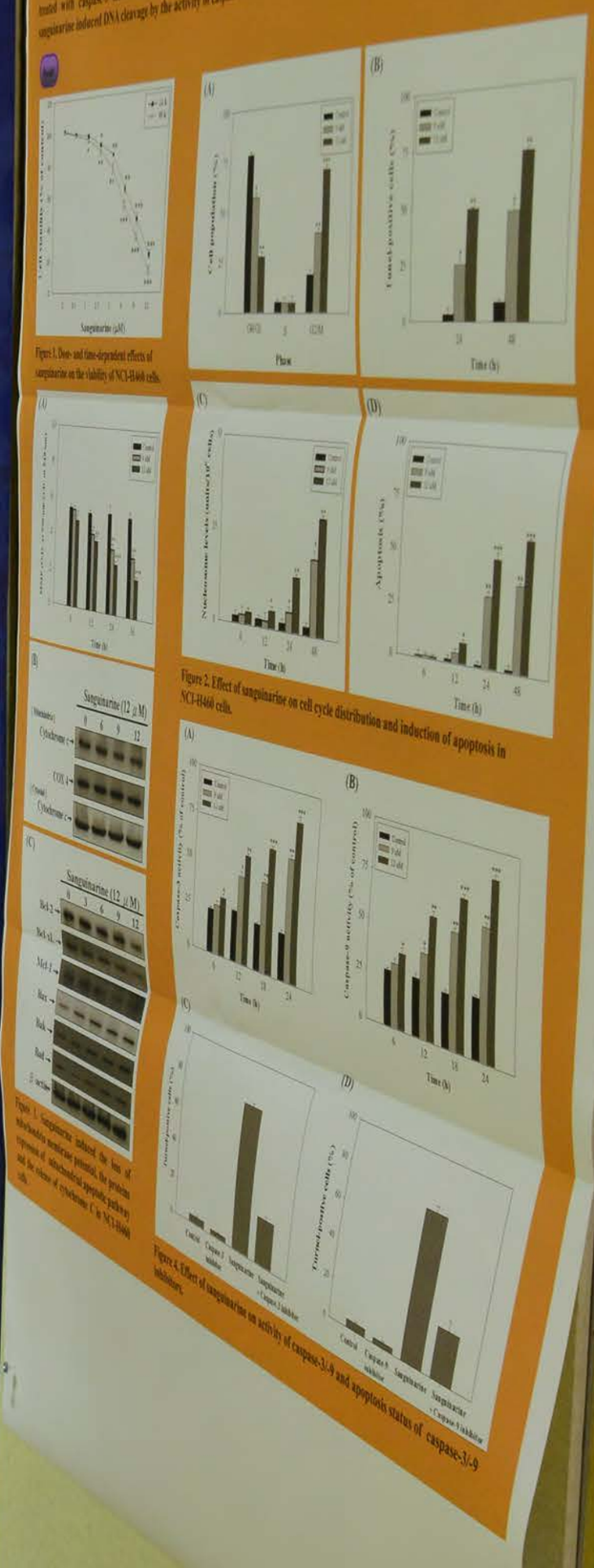
[2]Department of Biological Science and Technology and Graduate Institute of Biomedical Science, Chung Hwa University of Medical Technology, Tainan, Taiwan



Others

PO-03

Anti-proliferation , an apoptosis and anti-metastasis of *sanguinarine* in human lung adenocarcinoma cells

Ming-Der Shi[1] , Yuan-Wei Shih[2]

[1] Department of Pathology and Laboratory Medicine, Kaohsiung Veterans General Hospital Tainan Branch, Tainan, Taiwan
[2] Department of Biological Science and Technology and Graduate Institute of Biomedical Science, Chung Hwa University of Medical Technology, Tainan, Taiwan

Sanguinarine, a glycoalkaloid compound, are cancer preventive components found in rhizome of *Sanguinaria canadensis*. Some reports demonstrated that sanguinarine had various anti-carcinogenic properties. However, the molecular mechanisms of sanguinarine induce the death of NCI-H460 lung cancer cells, anti-proliferation and anti-metastasis are still unclear. In the present, sanguinarine induced NCI-H460 cells apoptosis and inhibited cells proliferation could be indentified by TUNEL assay, nucleosome assay, Annexin V-alexa flour 488/PI apoptosis detection assay and flow cytometry assay. Moreover, we found that sanguinarine may induce the loss of mitochondria membrane potential and release of cytochrome *c* by JC-1 and Western blotting assay. In mitochondria pathway, sanguinarine decreased the expressions of Bcl-2, Mcl-1, and Bcl-xL and increased the expressions Bax, Bad, and Bak. Further analysis demonstrated that sanguinarine induced the increrase of the casepase-3 and caspase-9 activity in dose- and time-dependent manner in NCI-H460 cells. NCI-H460 cells were treated with caspase-3 inhibitor (Z-DEVD-FMK) or caspase-9 inhibitor (Z-LEHD-FMK) or sanguinarine, the results showed that sanguinarine induced DNA cleavage by the activity of caspase-9 and caspase-3, thereby acting apoptosis of NCI-H460 .

Result

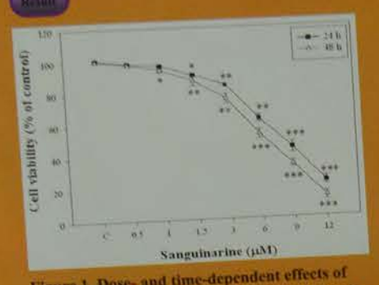
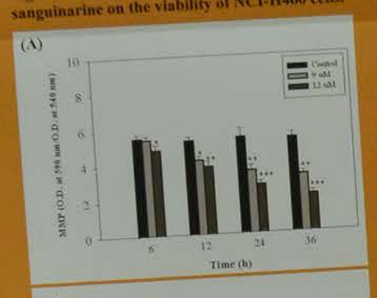
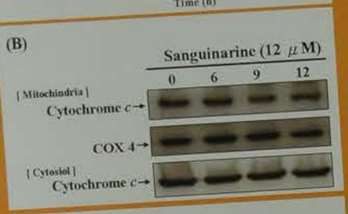


Figure 1. Dose- and time-dependent effects of sanguinarine on the viability of NCI-H460 cells.





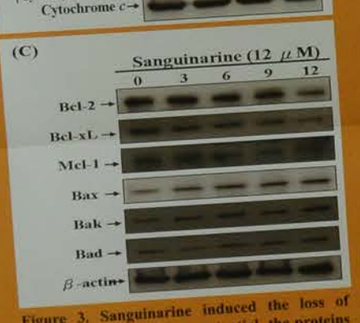


Figure 3. Sanguinarine induced the loss of mitochondria membrane potential, the proteins expression of mitochondrial apoptotic pathway and the release of cytochrome *C* in NCI-H460 cells.

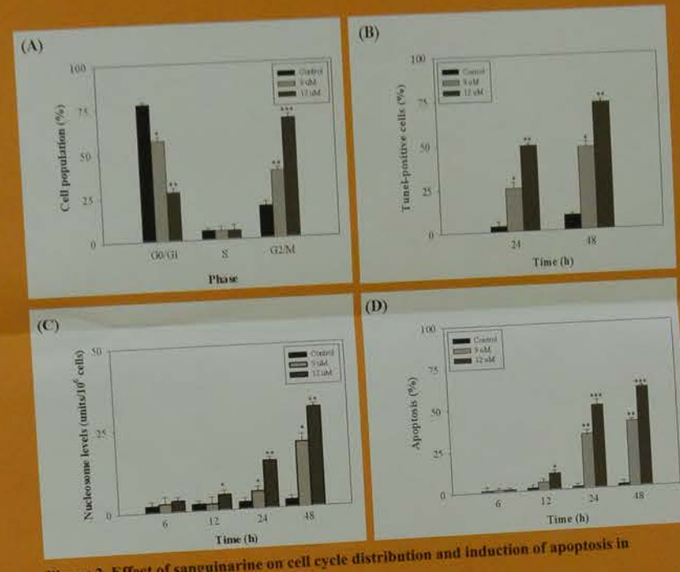


Figure 2. Effect of sanguinarine on cell cycle distribution and induction of apoptosis in NCI-H460 cells.

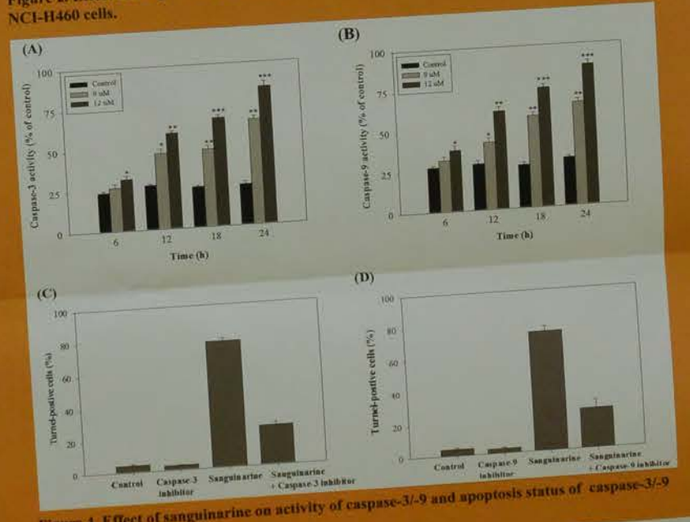


Figure 4. Effect of sanguinarine on activity of caspase-3/-9 and apoptosis status of caspase-3/-9 inhibitors.

Others

PO-04

Research and development of non-invasive hemoglobin concentration monitoring technology Application to extravasation detection system for medical safety in drip infusion therapy

Hiroyuki Nozaka[1)]

1) Graduate school of health sciences, Hirosaki university

Research and development of non-invasive hemoglobin monitoring Technology

- Application to extravasation detection system for medical safety in drip infusion therapy -

Hiroyuki Nozaka

Hirosaki University Graduate school of health sciences

HIROSAKI UNIVERSITY

Background

Laboratory tests are important for confirmation and follow-up of patient condition in therapy. Invasive blood drawing from patient vessel is carried out frequently, because blood specimens are required for hematological and biochemical tests. Therefore, the mental and physical burden is large for patients and medical staff, it is necessary to develop non-invasive laboratory test technology.

Invasive | Low-invasive | No-invasive Multi medical use

Objectives

1. Non-invasive hemoglobin monitoring technology
2. Application to infusion therapy monitoring technology

Optical sensing technology

Establishment of new biochemical analysis and patient monitoring technology

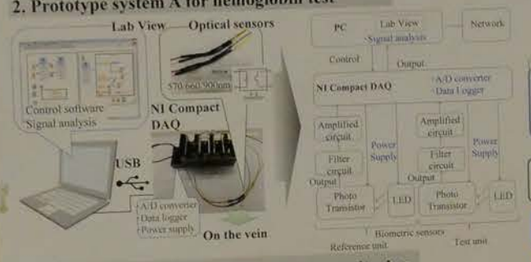
System configuration

1. Hardware and software

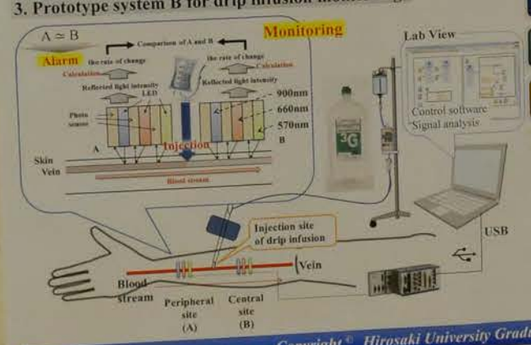
- Photo sensor: 570/660/900nm (Shinko denshi)
- Photo sensor: NJL5501L (New Japan Radio Co.,Ltd.)
- Spectrometers: apolloTM sensor(SCIVAX INC.)
- Data logger: NI Compact DAQ(National Instruments INC.)
- Development Software: LabView(National Instruments INC.)

Hb absorption spectrum

2. Prototype system A for hemoglobin test



3. Prototype system B for drip infusion monitoring



System evaluation

1 Percutaneous hemoglobin test

Method

- Sample: Human brachial vein blood with EDTA
- Method
1. Blood was diluted with drip solution "Solita T3 recovery drip" .
2. Blood was sealed in a transparent back.
3. Blood backs are inserted subcutaneous the chicken, and the reflected light was measured by each photo sensor.

Diluted blood with drip solution

Analysis by Prototype A

Hb ∝ Reflected light intensity change rate

Results

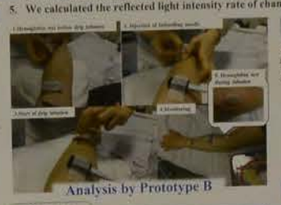
- Hemoglobin concentration and the reflected light intensity change rate correlated.
- The intensity change rate showed different results in accordance with the conditions of the skin.

- It was cleared that optical measurement error was caused by the fluctuations of skin permeation conditions.
- It is necessary to examine the hemoglobin absolute quantification.

2 Drip infusion monitoring test

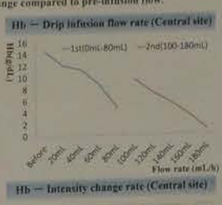
Method

1. The drip solution "Solita T3 recovery drip" was injected with infusion pump from brachial vein.
2. Photo sensor and spectrometer were set peripheral site and central site of inject site on the vein.
3. The flow rate varied from 0 ml/h to 200 ml/h, we measured the reflected light at site A and site B .
4. To understand the hemoglobin concentration of the blood diluted by infusion, blood was drawn from the central side each time to change the flow rate.
5. We calculated the reflected light intensity rate of change compared to pre-infusion flow.



Analysis by Prototype B

Hb ∝ Drip infusion flow rate (Central site)



Results

- Hemoglobin and the intensity change rate was correlated to the flow rate at central site.
- Hemoglobin and the intensity change rate was showed no change at peripheral site.

Suitable for relative quantitation

High rate means the success of the infusion, low rate may be an indicator of the extravasation or closure.

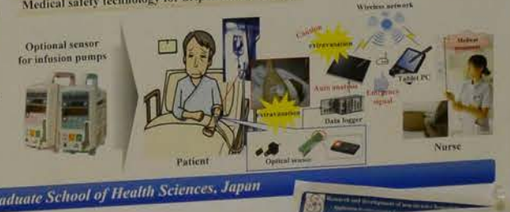
Hb ∝ Intensity change rate (Central site)

Conclusion

1. The optical hemoglobin method is not usable for absolute quantification of hemoglobin.
2. The optical hemoglobin method is suitable for relative quantitation of hemoglobin.
3. This system seems to be usable for the extravasation detection in drip infusion therapy.

Application to Medical safety by hemoglobin monitoring

Medical safety technology for drip infusion therapy



Acknowledgement and COI

Acknowledgement

This work was supported by SCOPE of the Japan Ministry of Internal Affairs and Communications.

Conflict of interest

The authors have no conflict of interest (COI) directly relevant to the content of this article

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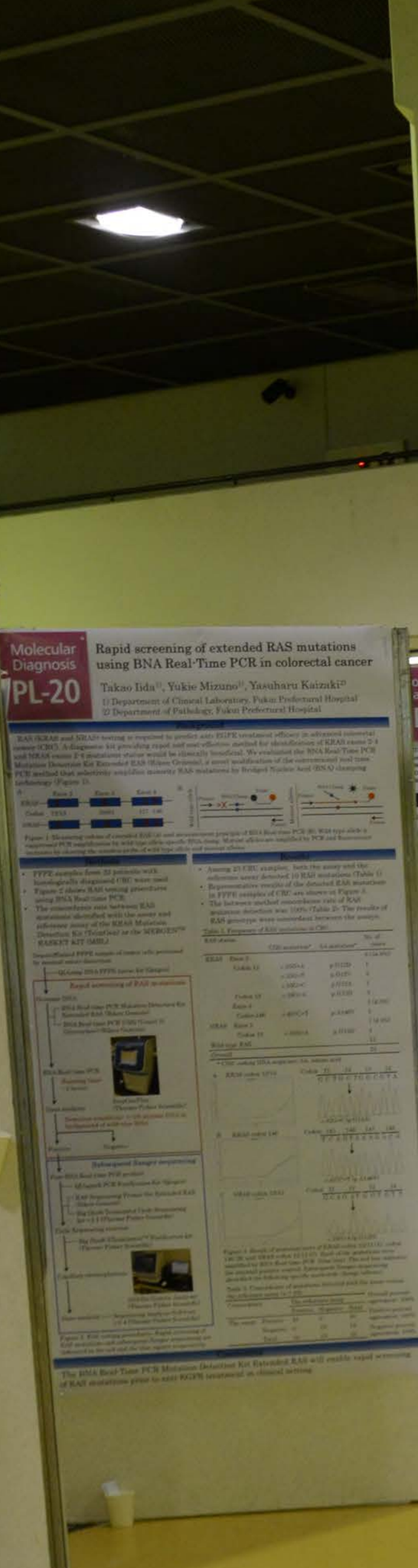
Molecular Diagnosis PL-20

Rapid screening of extended RAS mutations using BNA Real-Time PCR in colorectal cancer

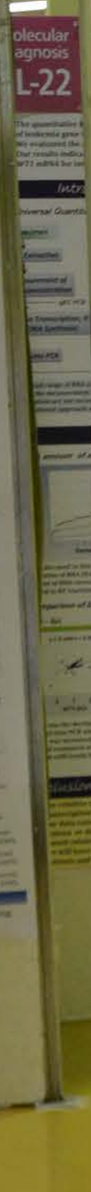
Takao Iida[1)], Yukie Mizuno[1)], Yasuharu Kaizaki[2)]

1) Department of Clinical Laboratory, Fukui Prefectural Hospital
2) Department of Pathology, Fukui Prefectural Hospital



The BNA Real-Time PCR Mutation Detection Kit Extended RAS will enable rapid screening of RAS mutations prior to anti-EGFR treatment in clinical setting.

Molecular Diagnosis PL-22



禁 煙

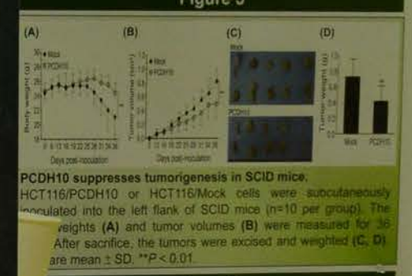
s a pivotal tumor suppressor gene in cer and its genetic loss predicts gnosis and tumor metastasis

g Tsai[3,4], Tzu-Ming Jao[1], Yu-Lin Hung[1], Wei-Ting Weng[1]

y Sciences and Medical Biotechnology, National Taiwan University; cine, National Taiwan University Hospital; l Tien Hospital; [4] Fu-Jen Catholic University, School of Medicine, Taiwan

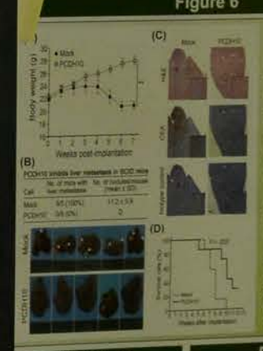
cer-related mortality worldwide. Genomic deletion occurring at on in CRC. By using loss of heterozygosity study, we identified in CRC. Ectopic expression of PCDH10 reduced cancer cell on and invasion, as well as increased spontaneous and serum s injection of PCDH10-expressing CRC cells in SCID mice th that in mock-inoculated mice. Furthermore, via intrasplenic cells restrained liver metastasis and improved survival in SCID ated tumor suppression are involved in the up-regulation of tenin. Taken together, PCDH10 could restrain cell growth and the development and progression of CRC. Consequently, the rognostic marker for the survival of patients with CRC.

Figure 5



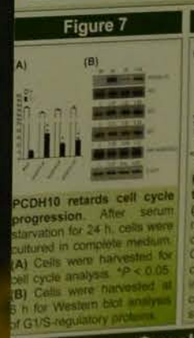
PCDH10 suppresses tumorigenesis in SCID mice. HCT116/PCDH10 or HCT116/Mock cells were subcutaneously inoculated into the left flank of SCID mice (n=10 per group). The weights **(A)** and tumor volumes **(B)** were measured for 36 After sacrifice, the tumors were excised and weighted **(C, D)** are mean ± SD. $^{**}P < 0.01$

Figure 6



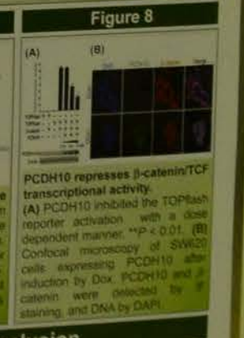
PCDH10 suppresses liver metastasis and increases overall survival. Cells were implanted into the spleens of SCID mice. The body weight was monitored **(A)**, and tumor nodules were enumerated in livers after sacrifice **(B)**. Arrows indicate tumor nodules. **(C)** H&E and IHC staining of CEA in liver tissue sections. T, tumor. Bar, 500mm. **(D)** Overall survival of SCID mice by Kaplan-Meier analysis (n=7 per group).

Figure 7



PCDH10 retards cell cycle progression. After serum starvation for 24 h, cells were cultured in complete medium. **(A)** Cells were harvested for cell cycle analysis. $^{*}P < 0.05$ **(B)** Cells were harvested at 6 h for Western blot analysis of G1/S-regulatory proteins.

Figure 8



PCDH10 represses β-catenin/TCF transcriptional activity. **(A)** PCDH10 inhibited the TOPflash reporter activation with a dose dependent manner. $^{**}P < 0.01$. **(B)** Confocal microscopy of SW620 cells expressing PCDH10 after induction by Dox. PCDH10 and β-catenin were detected by IF staining, and DNA by DAPI.

Conclusion

1. The present study demonstrates a new evidence for PCDH10 in suppression of liver metastasis, indicating that PCDH10 is a pivotal tumor suppressor in CRC.
2. The molecular mechanisms underlying PCDH10-mediated tumor suppression including: (1) Pro-apoptotic regulation; (2) Retardation of cell cycle progression; (3) Up-regulation of p53-p21 signaling and then down-regulation of pRb; (4) Inhibition of epithelial-to-mesenchymal transition by blocking the nuclear translocation of β-catenin.
3. The genetic deletion of PCDH10 represents an adverse prognostic biomarker for the survival of patients with CRC.

Others

PO-06

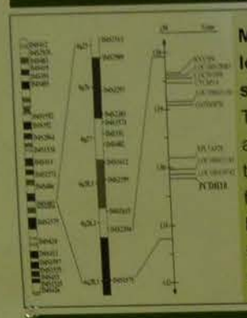
Protocadherin 10 is a pivotal tumor suppressor gene in colorectal cancer and its genetic loss predicts adverse prognosis and tumor metastasis

Ya-Chien Yang[1,2], Ming-Hong Tsai[3,4], Tzu-Ming Jao[1], Yu-Lin Hung[1], Wei-Ting Weng[1]

[1] Department of Clinical Laboratory Sciences and Medical Biotechnology, National Taiwan University; [2] Department of Laboratory Medicine, National Taiwan University Hospital; [3] Department of Surgery, Cardinal Tien Hospital; [4] Fu-Jen Catholic University, School of Medicine, Taiwan

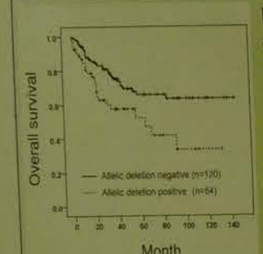
Colorectal cancer (CRC) is the leading cause of cancer-related mortality worldwide. Genomic deletion occurring at tumor suppressor loci is a common genetic aberration in CRC. By using loss of heterozygosity study, we identified Protocadherin 10 (PCDH10) as a tumor suppressor in CRC. Ectopic expression of PCDH10 reduced cancer cell proliferation, anchorage-independent growth, migration and invasion, as well as increased spontaneous and serum starvation-induced apoptosis *in vitro*. Subcutaneous injection of PCDH10-expressing CRC cells in SCID mice showed the reduction of tumor growth compared with that in mock-inoculated mice. Furthermore, via intrasplenic implantation, re-expression of PCDH10 in silenced cells restrained liver metastasis and improved survival in SCID mice. The molecular mechanisms of PCDH10-mediated tumor suppression are involved in the up-regulation of p53-p21 pathway and down-regulation of active β-catenin. Taken together, PCDH10 could restrain cell growth and epithelial-to-mesenchymal transition, and thus inhibit the development and progression of CRC. Consequently, the genetic deletion of *PCDH10* represents an adverse prognostic marker for the survival of patients with CRC.

Figure 1



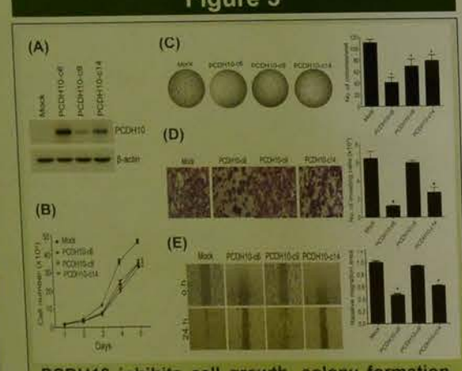
Microsatellite markers in loss of heterozygosity study of chromosome 4. The locations of markers and genes are based on the mapping information from the databases of the NCBI. *PCDH10*, the tumor suppressor gene at 4q28 is indicated in bold.

Figure 2



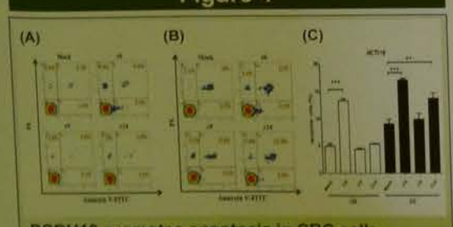
Kaplan-Meier survival analysis of 174 CRC patients according to the allelic deletion of *PCDH10* gene. Significantly reduced survival is observed in patients with genetic loss of *PCDH10* gene (*P*=0.0082).

Figure 3



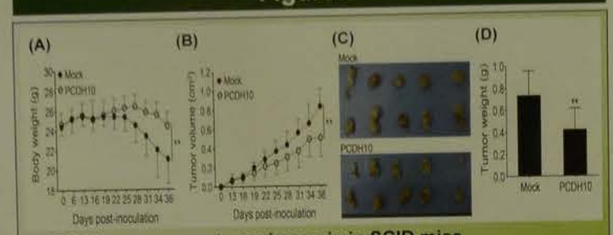
PCDH10 inhibits cell growth, colony formation, invasion and migration. (A,B) Cell proliferation assay of 3 PCDH10-experssing stable clones of HCT116 cells. **(C)** Anchorage-independent growth assay. **(D)** Matrigel invasion assay with the cell numbers in 10 fields after 24 h. **(E)** Wound healing assay. Data are the mean ± SEM. $^{*}P < 0.05$.

Figure 4



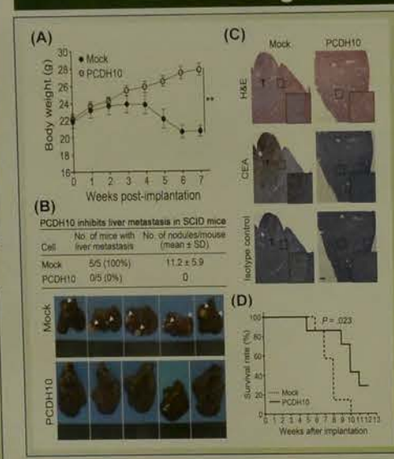
PCDH10 promotes apoptosis in CRC cells. **(A)** Cells cultured in complete medium (CM) were harvested for apoptosis analysis with Annexin-FITC and PI staining. **(B)** After serum starvation (SS) for 48 h, cells were harvested for apoptosis analysis. **(C)** Quantitative results of apoptosis in HCT116 cells. $^{*}P < 0.05$, $^{**}P < 0.01$, $^{**}P < 0.005$.

Figure 5



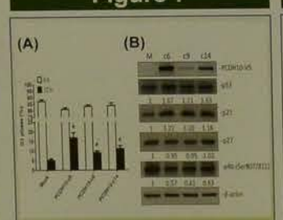
PCDH10 suppresses tumorigenesis in SCID mice. HCT116/PCDH10 or HCT116/Mock cells were subcutaneously inoculated into the left flank of SCID mice (n=10 per group). The body weights **(A)** and tumor volumes **(B)** were measured for 36 days. After sacrifice, the tumors were excised and weighted **(C, D)**. Data are mean ± SD. $^{**}P < 0.01$.

Figure 6



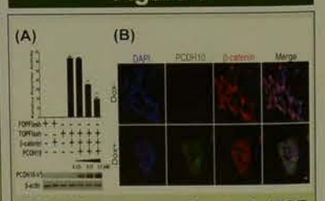
PCDH10 suppresses liver metastasis and increases overall survival. Cells were implanted into the spleens of SCID mice. The body weight was monitored **(A)**, and tumor nodules were enumerated in livers after sacrifice **(B)**. Arrows indicate tumor nodules. **(C)** H&E and IHC staining of CEA in liver tissue sections. T, tumor. Bar, 500mm. **(D)** Overall survival of SCID mice by Kaplan-Meier analysis (n=7 per group).

Figure 7



PCDH10 retards cell cycle progression. After serum starvation for 24 h, cells were cultured in complete medium. **(A)** Cells were harvested for cell cycle analysis. $^{*}P < 0.05$. **(B)** Cells were harvested at 6 h for Western blot analysis of G1/S-regulatory proteins.

Figure 8



PCDH10 represses β-catenin/TCF transcriptional activity. **(A)** PCDH10 inhibited the TOPflash reporter activation with a dose dependent manner. $^{**}P < 0.01$. **(B)** Confocal microscopy of SW620 cells expressing PCDH10 after induction by Dox. PCDH10 and β-catenin were detected by IF staining, and DNA by DAPI.

Conclusion

1. The present study demonstrates a new evidence for PCDH10 in suppression of liver metastasis, indicating that PCDH10 is a pivotal tumor suppressor in CRC.
2. The molecular mechanisms underlying PCDH10-mediated tumor suppression including: (1) Pro-apoptotic regulation; (2) Retardation of cell cycle progression; (3) Up-regulation of p53-p21 signaling and then down-regulation of pRb; (4) Inhibition of epithelial-to-mesenchymal transition by blocking the nuclear translocation of β-catenin.
3. The genetic deletion of PCDH10 represents an adverse prognostic biomarker for the survival of patients with CRC.

Others

PO-07

GETTING INVOLVED IN THE PUBLIC DEBATE

How this can be done with the help of ethical reflection

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Signe Raynås, Sørlandet sykehus, Kristiansand, Norway
Members of the Norwegian Institute of Biomedical Science's Ethics Committee
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INTRODUCTION

One of the principles of the Norwegian Institute of Biomedical Science's (BFI) code of ethics states:
"The Biomedical Laboratory Scientist shall contribute to introducing ethical aspects into the public health and welfare debate." (§ 9)
Legislation concerning direct-to-consumer testing is an example that has sparked a lively public debate in Norway. We invite you to participate in an ethical reflection on this topic.

METHOD

Ethical dilemmas occur when we have to choose between courses of action, each of which offer equally good or equally poor solutions. What are the consequences when our yes to alternative A means saying no to alternative B? By asking open[1] questions our aim is to uncover some of the challenges and rewards that at-home genetic testing can pose for the individual user and for society in general. Our aim is not to evaluate alternatives and arrive at a possible solution; it is to show how ethical reflection can be a useful tool in raising awareness of the dilemmas involved.

[1] An open question cannot be answered by a simple yes or no. It requires the respondent's reflections, knowledge or opinions.

WE INVITE YOU TO AN ETHICAL REFLECTION

How do we address the fact that at-home genetic tests are on sale to healthy citizens through private, commercial initiatives operating independent of the public health system?

- What is the core problem?
- Will the tests contribute to an improvement in the public's health and potential?

WHO IS INVOLVED?

- How will the test-person react to the results of the analysis?
- How will the test results affect family members?
- Should family members have the right not to know?
- Is the public health service involved in the interpretation and the follow-up of the results?
- Can other stakeholders, such as employers, insurance companies, sports environments etc., benefit from the test results?

WHICH VALUES ARE AT STAKE?

- Is the quality of the test analysis good enough to tell us anything accurate about our future health?
- What are the benefits for the test person?
- Will testing be perceived as coercion or as an opportunity to achieve more, in for example a particular sport?
- Will the test results offer people a better opportunity to be responsible for their own health?
- Does testing offer equal opportunities for all?
- How can the test person's privacy rights be protected?

WHAT ARE THE POSSIBLE CONSEQUENCES FOR THOSE INVOLVED?

- Will the public health service have to use resources on the interpretation of test results and the follow-up of healthy individuals?
- Will the test results serve as an excuse for or stimulate to a change in life style?
- Will insurance companies and employers misuse health information?
- Will children feel forced or encouraged to practise running if genetic testing reveals "good" genes for sprinting?
- How do we avoid genetic discrimination?

WHAT ARE THE ALTERNATIVES?

- How should the sale of at-home genetic tests be regulated, both nationally and internationally?
- Should the authorities restrict or prohibit the sale of at-home genetic tests?
- Do we need specific legislation for genetic testing used for specific diagnostic or treatment purposes?
- What requirements should commercial initiatives/vendors comply with regarding test quality and genetic guidance?

SUMMARY

Our aim is to contribute to biomedical laboratory scientists' participation in the public debate. We raise awareness by using simple methods for practicing ethical reflection on current events.

REFERENCES
NITO, Bioingeniørfaglig institutt (2013). *Etikk for bioingeniører*. Oslo.
Bioteknologirådet (2015). *Regulering av genetisk selvtesting*. Oslo. Ref. 2015:24
Eide, T & Aadland, E (2012). *Etikkhåndboka for kommunenes helse- og omsorgstjenester*. Oslo. Kommuneforlaget.

Withdraw

Others

PO-10

An investigation of intestinal parasites in one of the social welfare department in Taipei

Parasitic infections occur in the place of collective life easily

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Department of Medical Technology, Taipei City Hospital Yang-Ming Branch, Taiwan

TAIPEI CITY HOSPITAL

Background

This social welfare department was established by Taipei city government, in order to provide healthcare and vocational training for the intellectual disabilities. The intellectual disabilities in this social welfare department were between 3 to 60 years old. Parasitic infections occur in the place of collective life easily. Therefore, this survey was investigating the proportion of the cases infected with intestinal parasites in this social welfare department during 2014.

MATERIALS AND METHODS

Stool samples: 356 students who lived in this social welfare department

Methods: Used Merthiolate Iodine Formaldehyde (MIF) concentration method to examine all the stool samples.

Result

A total of 356 samples were examined by merthiolate iodine formaldehyde .95 samples of 356 examined were found to be positive for intestinal parasites, total positive rate was 26.68%.69 (19.38%) were male and 26 (7.3%) were female.Table1

Table1. Sex distribution and infection rate of intestinal parasites among 356 students

	Negative	Positive	Total(%)
Male	128	69	19.38%
Female	133	26	7.3%
Total	261	95	26.68%

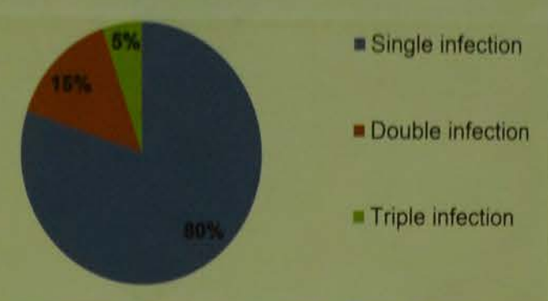
The total positive rate was 26.7%.Blastocystis hominis were the most intestinal parasites identified (71.58%), followed by Blastocystis hominis mixed with Endolimax nana(12.63%)and Endolimax nana (6.32%).Table2

Table2. Distribution of intestinal parasitic infection among 356 students

Parasite	Positive Case	Total (%)
Single infection		
Blastocystis hominis	68	71.58%
Endolimax nana	6	6.32%
Entamoeba hartmanni	1	1.05%
Enterobius vermicularis	1	1.05%
Double infection		
Blastocystis hominis+ Endolimax nana	12	12.63%
Blastocystis hominis+ Entamoeba hartmanni	1	1.05%
Blastocystis hominis+ Iodamoeba butschlii	1	1.05%
Triple infection		
Blastocystis hominis+ Endolimax nana+ Entamoeba hartmanni	2	2.11%
Blastocystis hominis+ Endolimax nana+ Iodamoeba butschlii	2	2.11%
Blastocystis hominis+ Entamoeba hartmanni+ Entamoeba histolytica	1	1.05%
Total	95	100%

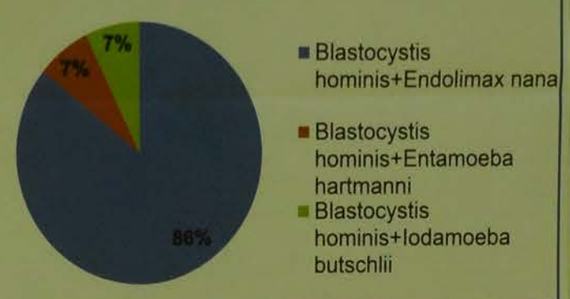
Of the total positive samples, 80% had single infection, followed 15% with double infection and 5% with triple infection.Figure1.

Figure1.Patterns of intestinal parasitic infection among 356 students



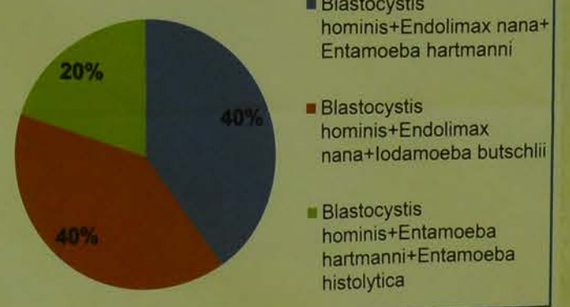
Of 14 double infection samples, 12(86%) were infected with Blastocystis hominis mixed with Endolimax nana being the most prevalent combination.Figure2.

Figure2.Distribution of double intestinal parasitic infection among 356 students



Blastocystis hominis mixed with Endolimax nana and Entamoeba hartmanni , Blastocystis hominis mixed with Endolimax nana and Iodamoeba butschlii were identified as the most common intestinal parasites in triple infection (40%).Figure3.

Figure3.Distribution of triple intestinal parasitic infection among 356 students



Conclusion

The positive rate of intestinal parasitic infection in this social welfare department (26.7%) was found higher than the foreigners examined in our hospital (14.6%).Therefore, in order to reduce the rate of intestinal parasites infection, the people live and work in this social welfare department have to improve their health education ,clean their residential environment , receive periodic examined and treatment.

Others
PO-09

PO-11 Use URR to analyze the relationship between patient weight and adequate dialysis

Huang Ming-Hui
Department of Hemodialysis, Chi Mei Medical Center, Tainan, Taiwan

Introduction

When kidney function is gone, blood dialysis replaces kidney function. Evaluation of dialysis treatment, is the BUN into URR (Urea Reduction Ratio) as one of the assessment tools. In General, under the same treatment should have a similar effect, but in the interpretation of data found that patients with URR Range between 57.83%~89.80% (74.18%) . Between KDOQI Guidelines to consider is to make adequate dialysis URR at least than 65% , And the target is URR Higher than the 70%. But in the dialysis not everyone can achieve this standard, the more obese people are less likely to achieve adequate dialysis. So this article is for body weight and dialysis efficiency for analysis and discussion. In selecting a group of patients with the same artificial kidneys for data analysis, patient weight 60Kg a demarcation line analysis found weighing less than 60Kg URR average 77.48% And weight is greater than 60Kg URR Average 70.68% ◦ In this group of patients with URR lower than 65% patients have 16 people, whose weight is greater than 65Kg. So that the more obese will affect dialysis efficiency.

Method

Interpretation is based on the analysis of the effects of dialysis treatment before and after BUN 、 Creatinine 、 K of test data to determine which BUN Converted by the URR (Urea Reduction Ratio) To effectiveness evaluation is the hemodialysis dialysis efficiency one of the common pointer.

URR (Urea Reduction Ratio) = (predialysis BUN- dialysis BUN)/ predialysis BUN

Analysis cannot be met URR65% Patients (N=16). Analysis of which age, dialysis pipeline, dialysis membrane area (m2) 、 URR range And dialysis time,and body weight.

Result

This group of patients using artificial kidney area 2.0 m^2 . Use autologous fistula for dialysis. In part weight: 16 patients greater than 65Kg (6 is greater than 90Kg). Dialysis part time: Is greater than 3.5HR(N=12), Less than 3.5HR(N=4) .

Table1. Analysis of results

Weight	<60kg	>60kg
URR range	57.83%~89.80% (74.18%)	
Average URR	77.48%	70.68%
The number of	111 People	101 People
Proportion of men and women	Male 45 People / Female 66 People	Male 76 People / Female 25 People
Age	30~89 age	31~81 age

Table2. Analysis of results

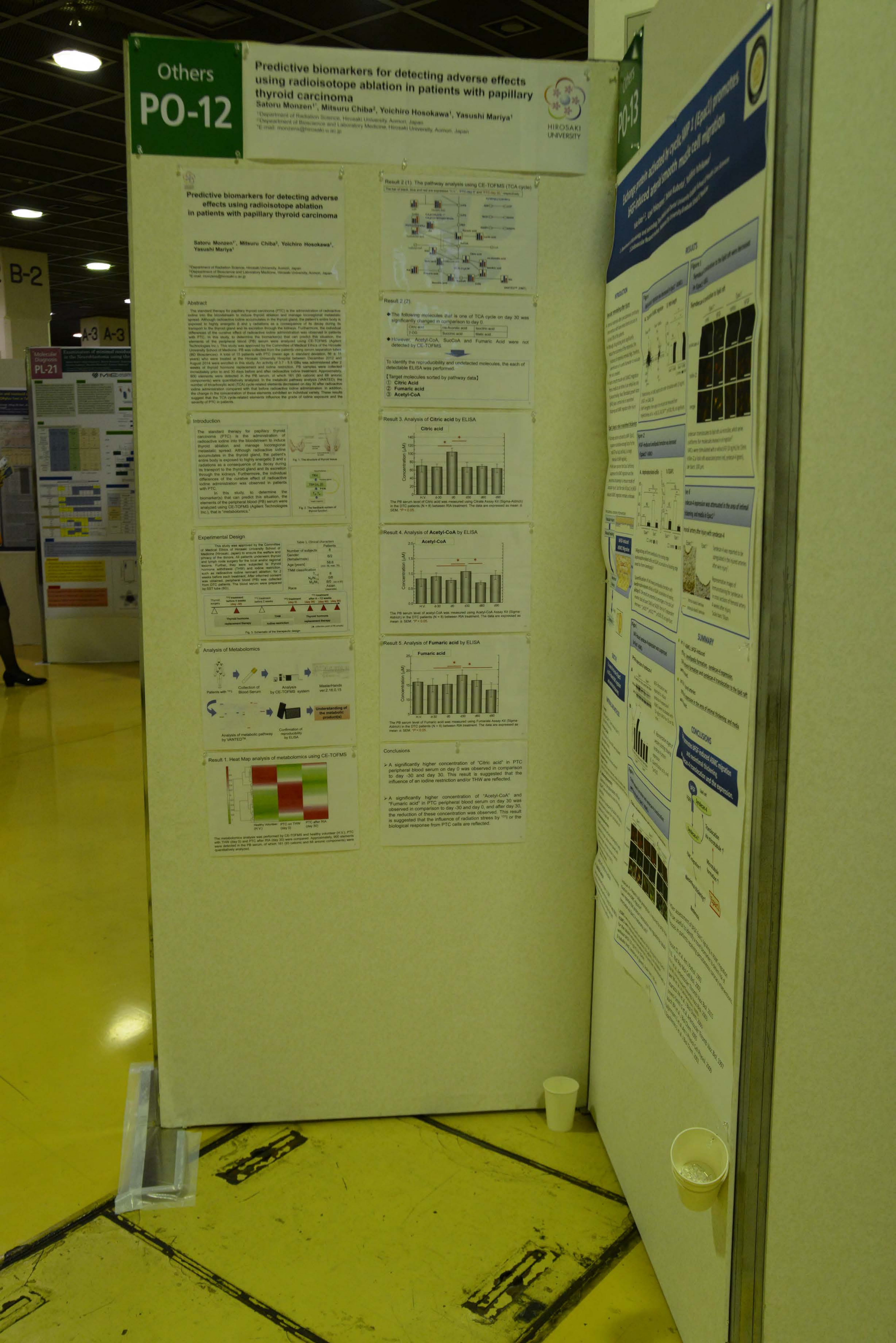
The number of	16 People (Male 15 men / women 1 man)
Age	42~83 age
Analysis of pipeline	AVF(autologous AV fistula)
The dialysis membrane area (m2)	2.0 m^2
URR range	56.64%~64.00% (60.99%)
Dialysis time	Is greater than 3.5hr (12 people) , Less than 3.5hr (4 people)
Weight	>65Kg :16 People

Discussion

Table1. Analysis found that weight gain is greater than 60Kg Patients relative to body weight less than 60Kg Patients with lighter weight have a higher dialysis efficiency. Table2 Find weight greater than 65 Kg, dialysis efficiency is poor. Because dialysis membrane area representative artificial kidney and blood of Exchange area, and film area more big relative need from body leads blood more more, weight more light who because total cycle blood less, if dialysis effect close Shi, should can select smaller membrane area of artificial kidney, avoid blood output volume had big instead caused heart burden; instead weight more heavy who, is can through using larger film area of artificial kidney for dialysis, to get better of dialysis quality. But in the absence of adequate dialysis patients also find that overweight may be larger because the body, causing toxins move by the peripheral tissues to the blood through the slow, resulting in poor dialysis efficiency, increasing dialysis time to improve outcomes may therefore be required in order to achieve adequate dialysis standards.

Reference

1. Handbook of dialysis (Chinese version) John T.Daugirdas Peter G. Blake Todd S. Ing


Others
PO-12
Predictive biomarkers for detecting adverse effects using radioisotope ablation in patients with papillary thyroid carcinoma
Satoru Monzen[1*], Mitsuru Chiba[2], Yoichiro Hosokawa[1], Yasushi Mariya[1]
HIROSAKI UNIVERSITY
Predictive biomarkers for detecting adverse effects using radioisotope ablation in patients with papillary thyroid carcinoma
Satoru Monzen[1*], Mitsuru Chiba[2], Yoichiro Hosokawa[1], Yasushi Mariya[1]
Abstract
Introduction
The standard therapy for papillary thyroid carcinoma (PTC) is the administration of radioactive iodine into the bloodstream to induce thyroid ablation and manage locoregional metastatic spread. Although radioactive iodine accumulates in the thyroid gland, the patient's entire body is exposed to highly energetic β and γ radiations as a consequence of its decay during its transport to the thyroid gland and its excretion through the kidneys. Furthermore, the individual differences of the curative effect of radioactive iodine administration was observed in patients with PTC.
In this study, to determine the biomarker(s) that can predict this situation, the elements of the peripheral blood (PB) serum were analyzed using CE-TOFMS (Agilent Technologies Inc.), that is "metabolomics."
Fig. 1. The structure of thyroid tissue
Fig. 2. The feedback system of thyroid function
Experimental Design
Table 1. Clinical characters
Fig. 3. Schematic of the therapeutic design
Analysis of Metabolomics
Patients with 131I
Collection of Blood Serum
Analysis by CE-TOFMS system
MasterHands ver.2.16.0.15
Analysis of metabolic pathway by VANTED™
Confirmation of reproducibility by ELISA
Understanding of the metabolic product(s)
Result 1. Heat Map analysis of metabolomics using CE-TOFMS
Healthy Volunteer (H.V.)
PTC on THW (day 0)
PTC after RIA (day 30)
The metabolomics analysis was performed by CE-TOFMS and healthy volunteer (H.V.), PTC with THW (day 0) and PTC after RIA (day 30) were compared. Approximately, 900 elements were detected in the PB serum, of which 161 (93 cationic and 68 anionic components) were quantitatively analyzed.
Result 2 (1). The pathway analysis using CE-TOFMS (TCA cycle)
Result 2 (2).
The following molecules that is one of TCA cycle on day 30 was significantly changed in comparison to day 0.
Citric acid
cis-Aconitic acid
Isocitric acid
2-OG
Succinic acid
Malic acid
However, Acetyl-CoA, SucCoA and Fumaric Acid were not detected by CE-TOFMS.
To identify the reproducibility and undetected molecules, the each of detectable ELISA was performed.
【Target molecules sorted by pathway data】
① Citric Acid
② Fumaric acid
③ Acetyl-CoA
Result 3. Analysis of Citric acid by ELISA
Citric acid
Concentration (μM)
H.V. d-30 d0 d30 d60 d90
The PB serum level of Citric acid was measured using Citrate Assay Kit (Sigma-Aldrich) in the DTC patients (N = 8) between RIA treatment. The data are expressed as mean ± SEM. *P < 0.05
Result 4. Analysis of Acetyl-CoA by ELISA
Acetyl-CoA
The PB serum level of acetyl-CoA was measured using Acetyl-CoA Assay Kit (Sigma-Aldrich) in the DTC patients (N = 8) between RIA treatment. The data are expressed as mean ± SEM. *P < 0.05
Result 5. Analysis of Fumaric acid by ELISA
Fumaric acid
The PB serum level of Fumaric acid was measured using Fumarate Assay Kit (Sigma-Aldrich) in the DTC patients (N = 8) between RIA treatment. The data are expressed as mean ± SEM. *P < 0.05
Conclusions
A significantly higher concentration of "Citric acid" in PTC peripheral blood serum on day 0 was observed in comparison to day -30 and day 30. This result is suggested that the influence of an iodine restriction and/or THW are reflected.
A significantly higher concentration of "Acetyl-CoA" and "Fumaric acid" in PTC peripheral blood serum on day 30 was observed in comparison to day -30 and day 0, and after day 30, the reduction of these concentration was observed. This result is suggested that the influence of radiation stress by 131I or the biological response from PTC cells are reflected.
Others
PO-13
Exchange protein activated by cyclic AMP 1 (Epac1) promotes bFGF-induced arterial smooth muscle cell migration
RESULTS
INTRODUCTION
SUMMARY
CONCLUSIONS
B-2
A-3 A-3
Molecular Diagnosis
PL-21

Others

PO-13

Exchange protein activated by cyclic AMP 1 (Epac1) promotes bFGF-induced arterial smooth muscle cell migration

Yuko Kato[1,2], Utako Yokoyama[2], Testuo Kubota[1], Yoshihiro Ishikawa[2]

1. Department of Microbiology and Immunology, Tokyo Medical and Dental University Graduate School of Health Care Sciences
2.Cardiovascular Research Institute, Yokohama City University,Graduate School of Medicine

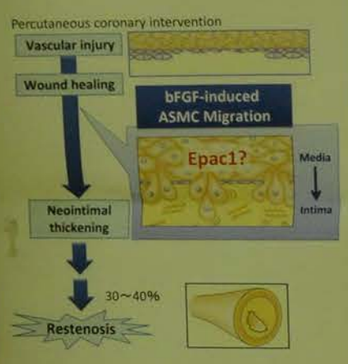
INTRODUCTION

Vascular remodeling after injury

- Arterial restenosis after percutaneous coronary interventions with bare-metal stents occurs in at least 30% of the patients.
- Although, drug-eluting stents significantly reduce the occurrence of the restenosis, the incidence of restenosis remains high, therefore, identification of a useful biomarker to evaluate the risk is needed.
- Aortic smooth muscle cell (ASMC) migration from a media to an intima is an initial key step to wound healing. Basic fibroblast growth factor (bFGF) plays a central role in neointimal thickening and ASMC migration after injury[1].

Epac1 plays a role in neointimal thickening

- Exchange protein activated by cAMP (Epac1), a guanine-nucleotide-exchange factor for the small GTPase Rap1 and Rap2, is a target molecule of cAMP signaling [2].
- We have reported that Epac1 deficiency suppresses the ASMC migration and the neointimal thickening in a mouse model of vascular injury[3], but the role of Epac1 in bFGF-induced ASMC migration remains unknown.



OBJECTIVE

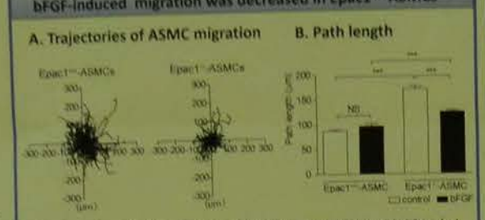
To assess the the role of Epac1 in bFGF-induced ASMC migration and neointimal thickening

MATERIALS AND METHODS

- **Animal**
  Wild type (Epac1$^{+/+}$), Epac1 knockout (Epac1$^{-/-}$) 3-8 month old male mice.
- **Primary Culture**
  Primary culture of mouse ASMCs were obtained by an explant method.
- **Wire Injury Model mice**
  A large wire inserted to femoral arteries[4]
- **Migration Assay**
  ASMC migration were observed under stimulation with bFGF (10 ng/ml) by using time-lapse imaging for 8 hours.
- **Immunocytochemistry**
  Expression of phosphorylated cofilin and IQGAP1 was evaluated to assess the lamellipodia formation.
  Expression of syndecan-4, β-tubulin and flotillin-2 was evaluated to assess the translocation of syndecan-4 to lipid raft.
- **Immunohistochemistry**
  Paraffin-embedded sections containing the aorta subjected to organ culture were stained with DAB chromogen substrate solution to detect syndecan-4 or FGF receptor (FGFR) 1.
- **Immunoblot Analysis**
  Whole cell lysate was analyzed by immunoblotting using anti-syndecan-4 antibody.
- **Statistical analysis**
  Data are expressed as means ± SEM.
  Statistical analysis was performed using One-way ANOVA followed by Bonferroni's multiple comparison test.
  A value of $p<0.05$ was considered significant.

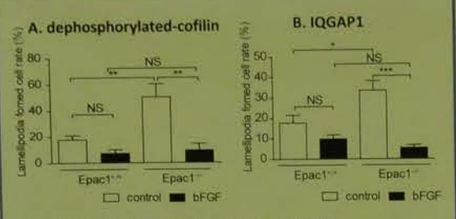
RESULTS

Figure 1
bFGF-induced migration was decreased in Epac1$^{-/-}$-ASMCs



A. Trajectories of ASMC migration paths under stimulation with 10 ng/mL bFGF. n=248, 204
B. Path lengths from origin to the end point are measured from trajectories of A. n=200,126, 248, 204 ***, $p<0.001$; NS, not significant.

Figure 2
bFGF-induced lamellipodia formation was decreased in Epac1$^{-/-}$-ASMCs

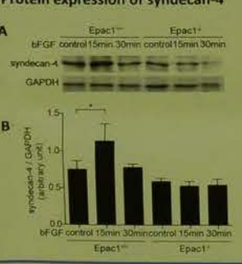


Migraiting cell forms lamellipodia at the leading edge. dephosphorylated cofilin and IQGAP1 accumulation at leading edge need to form lamellipodia[5,6].

Quantification of cells showing lamellipodelia formation with dephosphorylated cofilin(A) or IQGAP1 accumulation at leading edge(B). The results are presented as percentages of the total cell number. Total cell count 714(A) and 542(B) from 4 to 7 independent experiments. *, $p<0.05$ **, $p<0.01$,***, $p<0.001$; NS, not significant.

Figure 3
bFGF-induced syndecan-4 expression was suppressed in Epac1$^{-/-}$-ASMCs

Protein expression of syndecan-4

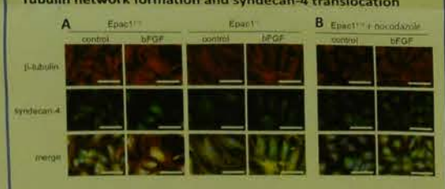


bFGF stimulation was reported to induce syndecan-4 expression[7]. ASMCs were incubated with 10 ng/mL bFGF for 15 or 30 min.

A. Representative images of western blotting showing syndecan-4 protein expression.
B. Quantification of A; n=4 *,$p<0.05$.

Figure 4
Tubulin network formation and syndecan-4 translocation were decreased in Epac1$^{-/-}$-ASMCs

Tubulin network formation and syndecan-4 translocation

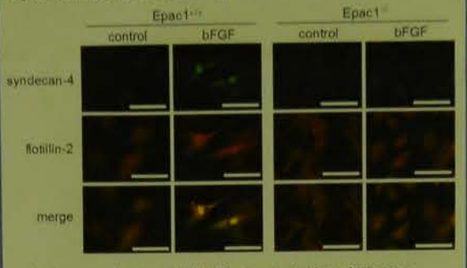


Syndecan-4, a heparin-sulfate proteoglycan, is required for bFGF-FGFR activation and ASMC migration[8].
It was reported that syndecan translocation was regulated by tubulin polymerization via Epac1 in melanoma cells[9].

A. ASMCs were stimulated with or without bFGF (10 ng/mL) for 15min.
B. ASMCs were exposed with nocodazol (10 μg/mL), an inhibitor for the tubulin network formation for 1h and then stimulated with or without bFGF (10 ng/mL) for 15min.
β-tubulin (red), syndecan-4 (green), Scale bars: 100 μm.

Figure 5
Syndecan-4 translocation to the lipid raft were decreased in Epac1$^{-/-}$-ASMCs

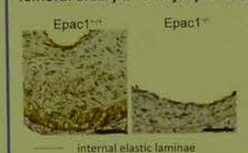
Syndecan-4 translocation to lipid raft



Syndecan translocates to lipid rafts via microtubles, which serve as platforms for molecules involved in cell migration[10].
ASMCs were stimulated with or without bFGF (10 ng/mL) for 15min. Flotillin-2,a lipid raft-associated protein (red), syndecan-4 (green), Scale bars: 100 μm.

Figure 6
syndecan-4 expression was attenuated in the area of intimal thickening and media in Epac1$^{-/-}$

femoral artery after injury with syndecan-4



Syndecan-4 was reported to be upregulated in the injured arteries after wire injury[7].

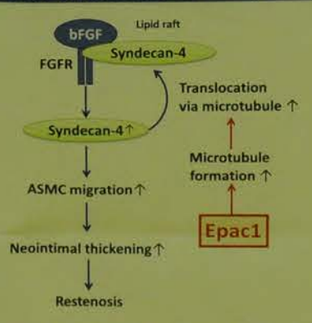
Representative images of immunostaining for syndecan-4 in cross sections of femoral artery 4 weeks after injury.
Scale bars: 50μm

SUMMARY

- In Epac1$^{-/-}$-ASMCs, bFGF-induced migration, lamellipodia formation, syndecan-4 expression, tubulin network formation and syndecan-4 translocation to the lipid raft were decreased.
- In Epac1$^{-/-}$ injured arteries syndecan-4 expression in the area of intimal thickening and media was attenuated.

CONCLUSIONS

Epac1 promotes bFGF-induced ASMC migration and neointimal thickening via syndecan-4 translocation and the expression.



Further assessment of bFGF-Epac1 signaling in ASMC migration might be useful to identify a novel biomarker to detect risk of restenosis in patients receiving percutaneous coronary interventions.

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ADAMTS14 Gene Polymorphism in the Development of Oral Cancer

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uction

ous cell carcinoma (OSCC) is a group of malignant lesions developing in the oral cavity and accounts for the ty (approximately 90%) of oral neoplasms Considering the heterogeneous nature and complex pathogenicity of these factors seem to be reciprocal and needed to evaluate the disease prognosis.

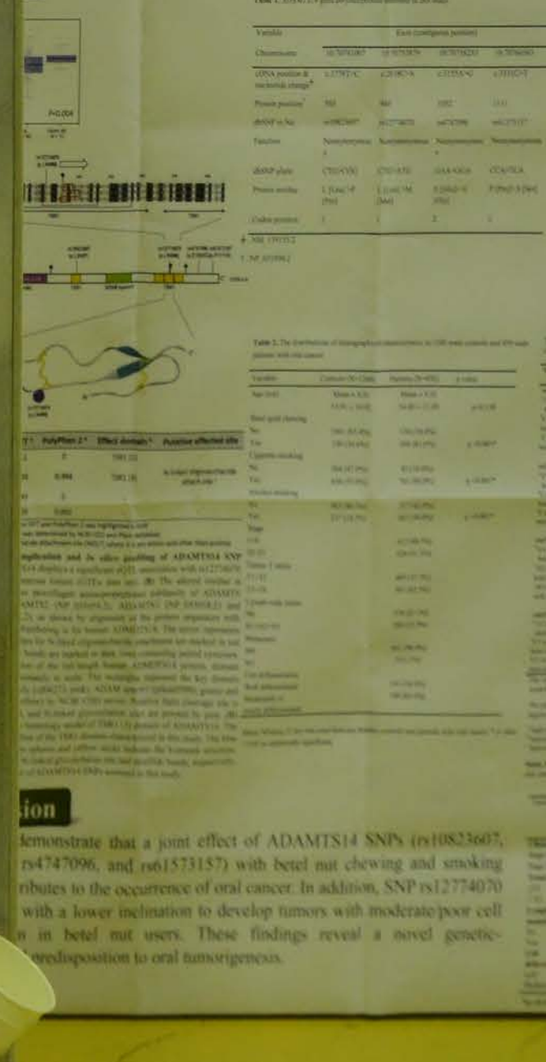
(a disintegrin and metalloprotease with thrombospondin motifs) proteases represent an extracellular zinc einase family with 19 members in humans. ADAMTS14 is a recently discovered procollagen N-propeptidase ns in reducing the solubility of the collagen molecules and facilitating their assembly into cylindrical collagen netic associations of ADAMTS14 with several conditions have been documented. Polymorphisms within the 14 gene have been shown to influence genetic predisposition to multiple sclerosis. Several other studies have ADAMTS14 gene variations as a risk component in knee osteoarthritis and Achilles tendon pathology. In s, there has been an explosion of reports concerning how these ADAMTS proteases can influence tumor onment to potentiate cancer progression. However, little is known regarding the joint effects of ADAMTS14 norphisms and behavioral exposure of cancer-causing substances on the predisposition to oral cancer. Here, we a hypothesis-driven case-control study to explore the effects of the interactions of ADAMTS14 gene isms with the environmental carcinogens on the risk of OSCC.

als and methods

his case-control study encompassed 850 male patients with oral squamous cell carcinoma and 1200 cancer-controls, with the approval by the institutional review board of Chung Shan Medical University Hospital in Taiwan. Participants were recruited from 2008 to 2015. Among the 850 cases, tumors were located in the osa, tongue, gingiva, palate, floor of the mouth, and others. Oral cancer patients were staged clinically at the gnosis according to the TNM staging system of the American Joint Committee on Cancer (AJCC).

nd genotyping of SNPs-To obtain adequate power for testing the potential association and evaluate the nctional relevance of ADAMTS14, four non-synonymous SNPs, including rs10823607, rs12774070, and rs61573157, with minor allele frequencies >5% were chosen (Table 1). Assessment of allelic ion for the *ADAMTS14* SNPs was performed by using the TaqMan assay with an ABI StepOne™ Real-Time m (Applied Biosystems, Foster City, CA, USA), and further evaluated with SDS version 3.0 software (Applied).

atics analysis-Several bioinformatics tools were used to assess a putative functional relevance of rs12774070. he Genotype-Tissue Expression (GTEx) database were used to identify the correlations between rs12774070 TS14 expression in esophagus mucosa tissues. The homology model of TSR1 (3) domain of ADAMTS14 was with the ribbon diagram (ViewerLite 5.0) by using Swiss Model sever (template as PDB accession number: 43% identity). Candidate deleterious non-synonymous SNPs were identified using SIFT and PolyPhen-2



ion

emonstrate that a joint effect of ADAMTS14 SNPs (rs10823607, rs4747096, and rs61573157) with betel nut chewing and smoking ributes to the occurrence of oral cancer. In addition, SNP rs12774070 with a lower inclination to develop tumors with moderate/poor cell n in betel nut users. These findings reveal a novel genetic-redisposition to oral tumorigenesis.

Others

PO-15

ADAMTS14 Gene Polymorphism in the Development of Oral Cancer

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Introduction

Oral squamous cell carcinoma (OSCC) is a group of malignant lesions developing in the oral cavity and accounts for the vast majority (approximately 90%) of oral neoplasms Considering the heterogeneous nature and complex pathogenicity of cancer, all these factors seem to be reciprocal and needed to evaluate the disease prognosis.

ADAMTS (a disintegrin and metalloprotease with thrombospondin motifs) proteases represent an extracellular zinc metalloproteinase family with 19 members in humans. ADAMTS14 is a recently discovered procollagen N-propeptidase that functions in reducing the solubility of the collagen molecules and facilitating their assembly into cylindrical collagen fibrils. Genetic associations of ADAMTS14 with several conditions have been documented. Polymorphisms within the ADAMTS14 gene have been shown to influence genetic predisposition to multiple sclerosis. Several other studies have implicated ADAMTS14 gene variations as a risk component in knee osteoarthritis and Achilles tendon pathology. In recent years, there has been an explosion of reports concerning how these ADAMTS proteases can influence tumor microenvironment to potentiate cancer progression. However, little is known regarding the joint effects of ADAMTS14 gene polymorphisms and behavioral exposure of cancer-causing substances on the predisposition to oral cancer. Here, we conducted a hypothesis-driven case-control study to explore the effects of the interactions of ADAMTS14 gene polymorphisms with the environmental carcinogens on the risk of OSCC.

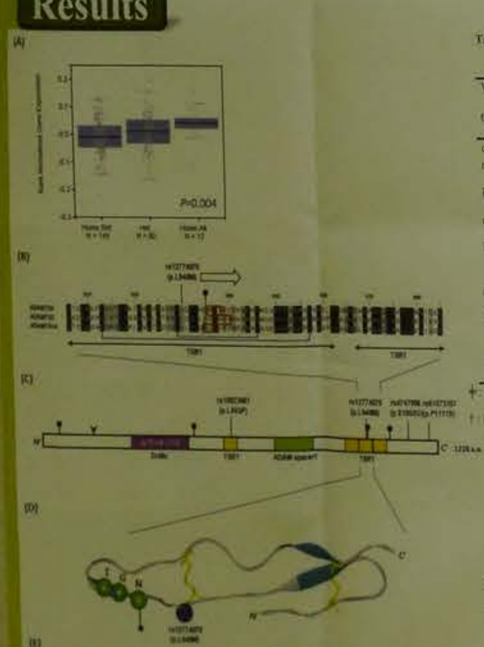
Materials and methods

Subjects-This case-control study encompassed 850 male patients with oral squamous cell carcinoma and 1200 cancer-free male controls, with the approval by the institutional review board of Chung Shan Medical University Hospital in Taichung, Taiwan. Participants were recruited from 2008 to 2015. Among the 850 cases, tumors were located in the buccal mucosa, tongue, gingiva, palate, floor of the mouth, and others. Oral cancer patients were staged clinically at the time of diagnosis according to the TNM staging system of the American Joint Committee on Cancer (AJCC).

Selection and genotyping of SNPs-To obtain adequate power for testing the potential association and evaluate the putative functional relevance of ADAMTS14, four non-synonymous SNPs, including rs10823607, rs12774070, rs4747096, and rs61573157, with minor allele frequencies >5% were chosen (Table 1). Assessment of allelic discrimination for the *ADAMTS14* SNPs was performed by using the TaqMan assay with an ABI StepOne™ Real-Time PCR System (Applied Biosystems, Foster City, CA, USA), and further evaluated with SDS version 3.0 software (Applied Biosystems).

Bioinformatics analysis-Several bioinformatics tools were used to assess a putative functional relevance of rs12774070. Data from the Genotype-Tissue Expression (GTEx) database were used to identify the correlations between rs12774070 and ADAMTS14 expression in esophagus mucosa tissues. The homology model of TSR1 (3) domain of ADAMTS14 was illustrated with the ribbon diagram (ViewerLite 5.0) by using Swiss Model sever (template as PDB accession number: 3GHM, 40.43% identity). Candidate deleterious non-synonymous SNPs were identified using SIFT and PolyPhen-2.

Results



SNP ID	A.A.	SIFT a	PolyPhen 2 a	Effect domain b	Putative effected site
rs10823607	L593P	0.1	0	TSR1 (1)	
rs12774070	L940M	0.01	0.966	TSR1 (3)	N-linked oligosaccharide attach site c
rs4747096	E1052G	0.43	0		
rs61573157	P1111S	0.26	0.002		

a. Deleterious SNP determined by SIFT and PolyPhen 2 was highlighted in bold
b. The protein domain structure was determined by NCBI CDD and Pfam databases
c. Consensus N-linked oligosaccharide attachment site (NX[S/T], where X is any amino acid other than proline)

Figure 1 | Functional implication and *In silico* profiling of ADAMTS14 SNP rs12774070. (A) ADAMTS14 displays a significant eQTL association with rs12774070 genotypes in esophagus mucosa tissues (GTEx data set). (B) The altered residue is conserved throughout three procollagen aminopropeptidase subfamily of ADAMTS proteases, including ADAMTS2 (NP_055059.2), ADAMTS3 (NP_055058.2) and ADAMTS14 (NP_631894.2), as shown by alignment of the protein sequences with Crustal Omega software. Numbering is for human ADAMTS14. The arrow represents b-strands, and consensus sites for N-liked oligosaccharide attachment are marked in red (pinpointed). The disulfide bonds are marked in dark lines connecting paired cysteines. (C) Schematic representation of the full-length human ADAMTS14 protein, domain symbols are drawn approximately to scale. The rectangles represent the key domain structures, ZnMc superfamily (cd04273; pink), ADAM spacer1 (pfam05986; green) and four TSR1 (smart00209; yellow) by NCBI CDD server. Putative furin cleavage site is indicated by an arrowhead, and N-linked glycosylation sites are pointed by pins. (D) Ribbon diagram depicts the homology model of TSR1 (3) domain of ADAMTS14. The ribbon indicates the Cα carbon of the TSR1 domain characterized in this study. The blue ribbon, purple sphere, green spheres and yellow sticks indicate the b-strands structure, SNP rs12774070, potential N-linked glycosylation site and disulfide bonds, respectively. (E) Pathogenicity prediction of ADAMTS14 SNPs assessed in this study.

Table 1. *ADAMTS14* gene polymorphisms assessed in this study.

Variable	Exon (contiguous position)			
Chromosome	10:70741007	10:70753879	10:70758253	10:70760503
cDNA position & nucleotide change‡	c.1778T>C	c.2818C>A	c.3155A>G	c.3331C>T
Protein position†	593	940	1052	1111
dbSNP rs No.	rs10823607	rs12774070	rs4747096	rs61573157
Function	Nonsynonymous	Nonsynonymous	Nonsynonymous	Nonsynonymous
dbSNP allele	CTG>CGG	CTG>ATG	GAA>GGA	CCA>TCA
Protein residue	L [Leu] >P [Pro]	L [Leu] >M [Met]	E [Glu]> G [Gly]	P [Pro]> S [Ser]
Codon position	2	1	2	1

‡: NM_139155.2
†: NP_631894.2

Table 2. The distributions of demographical characteristics in 1200 male controls and 850 male patients with oral cancer.

Variable	Controls (N=1200)	Patients (N=850)	p value
Age (yrs)	Mean ± S.D.	Mean ± S.D.	
	53.91 ± 10.02	54.60 ± 11.00	p=0.138
Betel quid chewing			
No	1001 (83.4%)	156 (18.4%)	
Yes	199 (16.6%)	694 (81.6%)	p<0.001*
Cigarette smoking			
No	564 (47.0%)	85 (10.0%)	
Yes	636 (53.0%)	765 (90.0%)	p<0.001*
Alcohol drinking			
No	963 (80.3%)	357 (42.0%)	
Yes	237 (19.7%)	493 (58.0%)	p<0.001*
Stage			
I+II		412 (48.5%)	
III+IV		438 (51.5%)	
Tumor T status			
T1+T2		489 (57.5%)	
T3+T4		361 (42.5%)	
Lymph node status			
N0		570 (67.1%)	
N1+N2+N3		280 (32.9%)	
Metastasis			
M0		841 (98.9%)	
M1		9 (1.1%)	
Cell differentiation			
Well differentiated		51 (6.0%)	
Moderately or poorly differentiated		799 (94.0%)	

Mann-Whitney U test was used between healthy controls and patients with oral cancer. * p value < 0.05 as statistically significant.

Table 3. Distributions of genotypic frequencies of *ADAMTS14* SNPs in controls and oral cancer patients.

Variable	Controls (N=1200) n (%)	Patients (N=850) n (%)	OR (95% CI)	AOR (95% CI)
rs10823607				
CC	1017 (84.7%)	714 (84.0%)	1.00	1.00
CT	175 (14.6%)	132 (15.5%)	1.074 (0.841-1.373)	1.028 (0.744-1.421)
TT	8 (0.7%)	4 (0.5%)	0.712 (0.214-2.374)	0.802 (0.154-4.175)
CT+TT	183 (15.3%)	136 (16.0%)	1.059 (0.831-1.348)	1.020 (0.741-1.404)
rs12774070				
CC	876 (73.0%)	616 (72.5%)	1.00	1.00
CA	290 (24.2%)	219 (25.8%)	1.074 (0.876-1.316)	1.059 (0.807-1.390)
AA	34 (2.8%)	15 (1.8%)	0.627 (0.339-1.162)	0.473 (0.210-1.065)
CA+AA	324 (27.0%)	234 (27.5%)	1.027 (0.843-1.251)	0.995 (0.763-1.293)
rs4747096				
AA	489 (40.8%)	360 (42.4%)	1.00	1.00
AG	568 (47.3%)	384 (45.2%)	0.918 (0.761-1.108)	1.001 (0.779-1.286)
GG	143 (12.0%)	106 (12.5%)	1.007 (0.757-1.340)	1.188 (0.809-1.746)
AG+GG	711 (59.3%)	490 (57.6%)	0.936 (0.783-1.119)	1.037 (0.818-1.315)
rs61573157				
CC	995 (82.9%)	702 (82.6%)	1.00	1.00
CT	194 (16.2%)	141 (16.6%)	1.030 (0.812-1.306)	1.030 (0.751-1.412)
TT	11 (0.9%)	7 (0.8%)	0.902 (0.348-2.338)	1.311 (0.355-4.845)
CT+TT	205 (17.1%)	148 (17.4%)	1.023 (0.811-1.291)	1.042 (0.764-1.420)

The odds ratio (OR) with their 95% confidence intervals were estimated by logistic regression models.

The adjusted odds ratio (AOR) with their 95% confidence intervals were estimated by multiple logistic regression models after controlling for betel nut chewing, alcohol and tobacco consumption.

Table 4. Associations of combined effects of *ADAMTS14* genotypic frequencies and betel nut chewing with oral cancer among 1401 smokers.

Variable	Controls (n=636) (%)	Patients (n=765) (%)	OR (95% CI)	AOR (95% CI)
rs10823607				
[a]CC genotype & non-betel nut chewing	[illegible]	[illegible]	1.00	1.00
[b]CT or TT genotype or betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
[c]CT or TT genotype with betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
rs12774070				
[a]CC genotype & non-betel nut chewing	[illegible]	[illegible]	1.00	1.00
[b]CA or AA genotype or betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
[c]CA or AA genotype with betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
rs4747096				
[a]AA genotype & non-betel nut chewing	[illegible]	[illegible]	1.00	1.00
[b]AG or GG genotype or betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
[c]AG or GG genotype with betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
rs61573157				
[a]CC non-betel nut chewing	[illegible]	[illegible]	1.00	1.00
[b]CT or TT genotype or betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]
[c]CT or TT genotype with betel nut chewing	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Table 5. [illegible]

Variable	CC	CA+AA	OR (95% CI)	p value
Clinical Stage				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tumor size				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lymph node involvement				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cell differentiation				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Conclusion

Our results demonstrate that a joint effect of ADAMTS14 SNPs (rs10823607, rs12774070, rs4747096, and rs61573157) with betel nut chewing and smoking causally contributes to the occurrence of oral cancer. In addition, SNP rs12774070 is associated with a lower inclination to develop tumors with moderate/poor cell differentiation in betel nut users. These findings reveal a novel genetic-environmental predisposition to oral tumorigenesis.

Others

PO-16

FÜRST | MEDISINSK LABORATORIUM

Blood sampling in the patient's home.

Hilde Fjeld Myrvold, Manager of department, PasientService, Fürst Medical Laboratory, Norway.
Line Merete Grønvold, Manager Home testing, Fürst Medical Laboratory, Norway

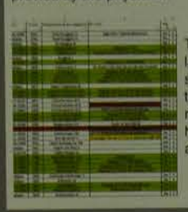
Background and objectives

Blood sampling in the patient's home is an uncommon practice in Norwegian healthcare. Some patients are, for different reasons, not able to travel to the doctor's office or outpatient's department, without assistance, and is dependent on expensive transport as taxi, ambulance or facilitated transport. This costs the health care system a lot of money. Fürst Medical Laboratory have offered phlebotomy in patients' homes in Oslo for over 50 years. The patient is only charged a small sum for the phlebotomy. So far, it has been difficult to get public funding to pay for the visits.

Methods

The patient's physician initiates need for phlebotomy in the home. Completed requisition with the patient's phone number, relatives or home-nurse is sent to Fürst Medical Laboratory.

When arrived it is evaluated and is added to the driving-list based on the information provide by the physician



The Biomedical laboratory scientist contact the patient, relatives or home-nurse to arrange for visit.

Sampling equipment packed for the tubes needed for the ordered analyzes

The phlebotomist drives to all the patients on the driving list

To ensure control off patient data, the patient must provide the names and personal identification before blood sampling. The phlebotomist check this against what is written on the requisition.

Inspection of the injection site is performed while ensuring that the patient is fine.

After completing blood collection, the phlebotomist transport the blood samples back to the laboratory for separation and analyzing.

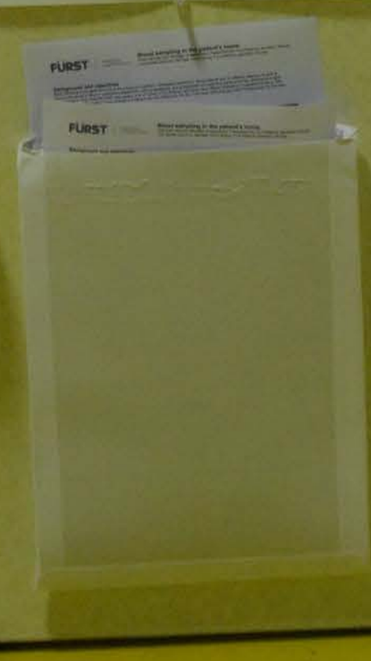
Before separation, the tubes are checked against requisition.

All tubes are analyzed in our fully automated laboratory system.

After validation the results transferred electronically to the physician

Conclusion:

There is an increasing need for phlebotomy at home in Norway, not only because patients are released earlier from hospitals, but also because it is more common for the old and sick to live at home as long as possible before being admitted to a nursing home.
A service like ours allows for a blood test in a safe and familiar environment while saving the patients' time and energy. In addition, the solution saves taxpayers money.



Others

PO-17

Serum PTX3 level is associated with periodontitis in community-dwelling people in JAPAN

Reiko Furugen[1], Hideaki Hayashida[1], Koji Kawasaki[1], Takashi Maeda[2], Toshiyuki Saito[1]
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[2] Department of Community Medicine, Nagasaki University Graduate School of Biomedical Science, Nagasaki, Japan

Objectives

Periodontitis is a chronic inflammatory disease characterized by the destruction of supportive connective tissues surrounding the roots of teeth in response to subgingival infection with various periodontal pathogens. Recent evidence has shown that low-grade inflammation such as that occuring in periodontal disease may play a role in atherosclerosis. The cardioankle vascular index (CAVI) has recently been developed as a new tool to assess arterial stiffness of the aorta, femoral artery, and tibial artery and is an approproate atherosclerosis screening tool. Systemic diseases can be measured using serum markers of inflammation. C-reactive protein (CRP) has been widely investigated is the acute-phase ptotein, the classic short pentraxin that are produced in the liver in response to systemic inflammatory cytokines.

Pentraxin 3 (PTX3) is a member of the pentraxin family such as C-rective protein and serum amyloid P. PTX3 expected to a new biomarker for vascular disease, due to the predominantly involved in atherosclerotic lesion. Elevated PTX3 levels have been reported in many types of cardiovascular disease, including acute myocardial infarction. The concentration of PTX3 is associated with cardiovascular risk factors. The aim of this study was to examine associations between serum levels of PTX3 and periodontitis in community dwellers.

Methods

Study population

In 2009-11, 230 participants attended a mass health examination in Goto City, Nagasaki Prefecture, Japan. This included a periodontal assessment and the completion of a detailed medical questionnaire, which included the recording of smoking and alcohol consumption habits. Participants were excluded from the study if they were <60 years old, had <10 teeth and have a smoking history. All subjects provided a signed informed consent prior to participation in this study. The study was approved by the Ethics Committee of Nagasaki University Graduate School of Biomedical Sciences (No. 090528160).

Dental examination

One of four calibrated dentists carried out each periodontal examination under sufficient illumination using artificial light. The probing pocket depth (PPD) and attachment loss (AL: the distance from the cementoenamel junction to the bottom of the pocket) were measured using a period

Periodontal status was classified as healthy or mild, moderate, or severe periodontitis as proposed by the Cenontal probe at the mesiobuccal and midbuccal sites for all the teeth present, excluding the third molars. ter for Disease Control and Prevention in partnership with the American Academy of Periodontology. *Severe periodontitis* was defined as the presence of 2 or more inter-proximal sites with ≥6mm AL (not on the same tooth) and 1 or more inter-proximal site(s) with ≥5mm PD. *Moderate periodontitis* was defined as 2 or more inter-proximal sites with ≥4mm clinical AL (not on the same tooth) or 2 or more inter-proximal sites with PD ≥5mm, also not on the same tooth. *Mild periodontitis* was defined as ≥2 inter-proximal sites with ≥3mm AL and ≥2 inter-proximal sites with ≥4mm PD (not on the same tooth) or 1 site with ≥5mm.

Data collection and laboratory measurements

Each subject's height and weight were measured, and BMI (kg/m^2) was calculated as an index of obesity. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded at rest. Blood samples were collected from each participant after an overnight fast. Serum was separated and stored at -20°C for <3 days until assay. High-density lipoprotein cholesterol (HDL-cho) was measured by a direct method and low-density lipoprotein cholesterol (LDL-C) levels were calculated by the Friedewald equation. Hemoglubin A1c (HbA1c) levels were measured by the latex agglutination reaction.

Serum PTX3 levels was examined using an enzyme-linked immunosorbent assay (ELISA) kit (R&D systems)

Statistical analysis

Characteristics of study participants are presented as means with standard deviation or number (percentage). Statistical analysis was performed by simple comparison between subjects with healthy or *Mild* periodontitis and those with *Moderate* or *Severe* periodontitis using the Mann-Whitney *U-test*.Median value was used as a cutoff point for high or low levels of serum PTX3.. The odds ratios (OR) and 95% confidence intervals (CI) were calculated.BMI and PTX3 levels were used as dependent variables. Statistical analyses were performed using SPSS 23.0 for Mac (IBM, Tokyo, Japan).

Results

Table. 1 Baseline characteristics

	mean±sd	median	mean±sd	median	*P*
Age	66.7±4.8	67.0	68.0±5.2	69.0	0.056
SBP (mmHg)	134.4±17.1	133.0	137.1±17.4	135.0	0.294
DSP (mmHg)	79.1±8.6	78.0	80.0±9.2	79.0	0.583
HDL-cho (mg/dL)	62.8±15.9	61.0	63.3±14.6	62.0	0.495
LDL-cho (mg/dL)	121.3±28.4	122.0	123.4±29.2	122.0	0.845
BMI (kg/m^2)	22.8±3.1	22.4	22.3±2.9	22.2	0.14
HbA1c (%)	5.3±0.4	5.2	5.3±0.4	5.2	0.618
PTX3 (ng/mL)	1.7±1.5	0.9	1.5±1.6	1.1	0.021
mean PD (mm)	1.4±0.4	1.4	1.7±0.6	1.6	0.001
mean AL (mm)	2.0±0.4	2.1	2.9±0.7	2.8	0.001
CAVI	8.0±1.1	8.1	7.9±0.9	8.1	0.513
ABI	1.1±0.9	1.1	1.1±0.8	1.1	0.495

Table 1 compares PTX3 and other factors between healthy/mild and moderate/severe periodontitis. PTX3 was significantly higher in the subjects with moderate/severe periodontitis. CAVI and ABI showed no significant difference between groups.

Table.2 Correlations between CAVI and other parameters

	CAVI	
	r	P value
PTX	0.005	0.892
BMI	0.022	0.369
γGTP	0.094	0.001
HDL-cho	-0.153	0.001
LDL-cho	-0.067	0.007
ABI	0.143	0.001
DI (Debrie index)	0.17	0.001
Mean PD	0.111	0.001
Mean AL	0.293	0.001

Speaman's rank correlation coefficient

CAVI was negatively correlated to serum PTX3 levels.

Table.3 Logistic regression analysis with periodontal conditions

Independent Variable		Moderate to severe periodontitis/others Adjusted OR (95%CI)	*P*
BMI	< 25	1.0	
	≥ 25	0.78(0.46-1.37)	0.412
PTX3	< 0.9	1.0	
	≥ 0.9	1.577(1.007-2.46)	0.047

Severe periodontitis was significantly associated with an increased level of PTX3. BMI ≥25 was not significantly associated with the PTX3 level.

Conclusion

PTX3 levels are increased in moderate or severe periodontitis. Therefore, the increased level of serum PTX3 can be regarded as a potential inflammatory marker for periodontitis.

Others

PO-18

Phrenic nerve conduction studies in chronic heart failure

Masayoshi Oguri[1, 2], Mariko Miyagi[3], Takeshi Sota[3], Ayako Hara[2], Yoshiharu Kinugasa[4], Toru Motokura[2]

1. Department of Pathobiological Science and Technology, Faculty of Medicine, Tottori University, Yonago, Japan
2. Division of Clinical Laboratory, Tottori University Hospital, Yonago, Japan
3. Division of Rehabilitation, Tottori University Hospital , Yonago, Japan
4. Division of Cardiovascular Medicine, Department of Molecular Medicine and Therapeutics, Faculty of Medicine, Tottori University , Yonago, Japan

Introduction

Patients with chronic heart failure (CHF) have reduced exercise tolerance and are limited in performing the activities of daily life. Breathlessness is also a common problem in CHF patients, and respiratory muscle strength has been proposed to play an important role in causing breathlessness in these patients[1]. Several studies have suggested that the respiratory muscles are weak in patients with CHF, but the etiology of this weakness is unclear. Maximal expiratory pressure (MEP) and maximal inspiratory pressure (MIP), which are the most common indicators of respiratory muscle strength, are related to the severity of CHF[1]. In 1936, Heinbecker, et al measured phrenic nerve conduction velocity in human[2]. Phrenic nerve dysfunction is one of the causes of respiratory muscle weakness. However, the effect of phrenic nerve on respiratory muscle weakness in patients with CHF have not been studied. The present study was aimed to evaluate the relationship between phrenic nerve dysfunction and respiratory muscle strength in patients with CHF.

Subjects

Twenty four inpatients with CHF (11 men) with a mean age (SD) of 77 years (9.7) and 29 healthy volunteers (8 men) with age of 23 years (4.7) were studied. Informed consent was obtained from each subject before study entry.

The etiology of heart failure was congestive heart failure (n = 19), atrial septal defect (ASD) (n = 1), cardiogenic pulmonary edema (n = 1), cardiac sarcoidosis, and idiopathic pulmonary arterial hypertension (n= 1). All patients had an enlarged heart on chest radiography. The study protocol was approved by institutional review boards.

Phrenic nerve conduction study (PNCS)

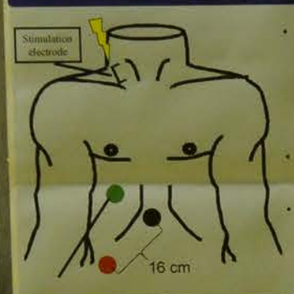


Figure 1. Arrangement of electrodes

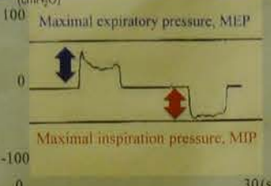
- A bipolar stimulating electrode, two disposable self-adhesive disk recording electrodes, and an EMG system (Nihonkohden, Japan) with standard settings (filters: 2 Hz to 10 kHz) were used.
- Position of stimulation was the posterior border of the sternocleidomastoid.
- For CMAP recording the active electrode (black circle) was fixed 5 cm above the xiphoid process, and the reference electrode (red circle) 16 cm from black circle, on the chest margin ipsilateral to the stimulated phrenic nerve (Fig. 1)[3].

The wave of PNCS (normal data)

Figure 2. Action potential recorded with surface electrodes on phrenic nerve in control subject

- Electrical stimulation was carried out with rectangular pulses of 0.1-ms duration.
- Several mesurements were made during maximal inspiration.
- We identified the stimulus current (mA) at which the maximal compound motor action potential (CMAP) amplitude was obtained.
- We selected the wave of maximal amplitude.
- Both right and left of CMAP onset latency (ms) and amplitude which was defined by base to peak (mV) were measured.

Respiratory muscle strength



- Mesurement of MEP and MIP were obtained with the use of a multificational spirometer (HI-80; Chest, Tokyo, Japan) as recommended by the American Thoracic Society.
- By using a nose clip and disposable mouthpiece, the patients maintained maximal inspiratory or expiratory effort against a closed valve for at least 3 s to measure the maximal inspiratory pressure (MIP) or the maximal expiratory pressure (MEP), respectively.
- MEP and MIP were expressed as the percentage of normal predicted value (%MEP, %MIP).
- Inspiratory muscle weakness was defined as %MIP <70%.

Figure 3. The wave of MEP and MIP

Results

1. **PNCS (Figure 4, Table 1)**
- In the control group, We found no significant differences of the amplitude and the onset latency of PNCS between left and right phrenic nerves.
- In the CHF group, the amplitude had no significant difference between left and right, but the left onset latency was significantly more prolonged than the right one.
- The onset latency of the CHF group was significantly prolonged than the control group.

Figure 4

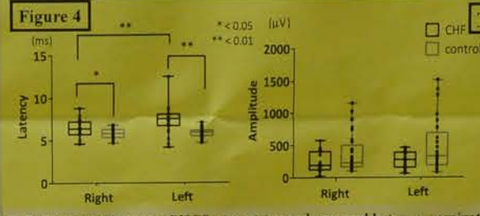


Table 1. Results of PNCS parameter

	Side	Latency (ms)	Amplitude (μV)
CHF	Left	7.5 ± 1.7	270 ± 134
	Right	6.4 ± 1.1	240 ± 152
Control	Left	5.8 ± 0.5	270 ± 141
	Right	5.7 ± 0.6	220 ± 101

Mean and the standard deviation of PNCS parameter

2. **Relationship between PNCS parameter and age, and between respiratory muscle potential and age in CHF (Figure 5)**
- Only the %MEP and the age were significantly correlated.

Figure 5

3. **Relationship between PNCS parameter and respiratory muscle potentials (Figure 6)**
- In CHF group, the latency of the left phrenic nerve and the %MIP were significantly correlated.
- In control group, the amplitude of the both phrenic nerve and %MEP were significantly correlated.

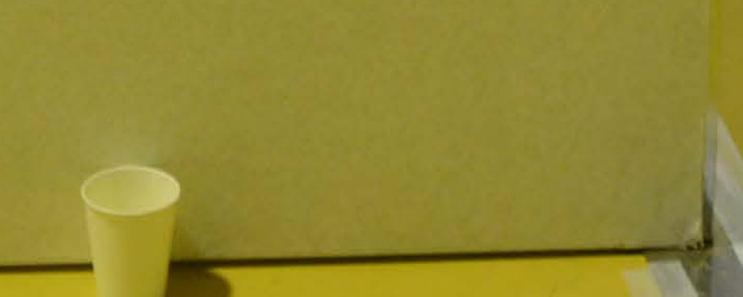


Figure 6

Latency vs respiratory muscle potential

Amplitude vs respiratory muscle potential

Discussions

This is the first report that quantitatively analyzed patients with CHF by PNCS. Onset latency of the PNCS is the most useful in detecting demyelination of the phrenic nerves. The latency is primarily the time required for the action potential to travel from the site of stimulation to the nerve terminal, but it also includes the time required for the stimulus to activate an action potential in the underlying nerve and the time needed for neuromuscular transmission to activate the muscle fiver action potentials. Demyelinating neuropathy is associated with prolonged latency. In addition, the latency is delayed due to reduction of activated axon by aging. In this study, prolongation of onset latencies in CHF may be caused by aging and/or subacute neuropathies as segmental demyelinating neuropathies.

The prolongation of the latency in left phrenic nerve was associated with reduction of %MIP and the lower amplitudes of both phrenic nerves were correlated with %MEP. The respiratory muscles are weak in patients with heart failure and this weakness reflects a more generalized myopathic process[4]. These data suggested that respiratory muscle weakness in CHF patients is partially related to demyelinating lesions in the phrenic nerve caused by CHF.

Conclusions

PNCS may be able to assess the severity of respiratory muscle weakness as %MIP in CHF patients.

Reference

1. Kataoka Y, et al. The Relation of Respiratory Muscle Strength to Diaphragm Sensory and Abdominal Ventilation During Exercise in Chronic Heart Failure Patients. Res Cardiovasc Med 2015; 4: e28044.
2. Heinbecker, P, et al. Functional and histologic studies of somatic and autonomic nerves of man. Arch Neurol Psychiat 1936; 35: 1233-55.
3. Reimers-Gaspersic, A, et al. Phrenic nerve conduction studies: technical aspects and normative data. Muscle & nerve 2008; 37: 36-42.
4. Evans AA, et al. Respiratory muscle strength in chronic heart failure. Thorax 1995; 50: 625-628.

D-2 D-2

Molecular Diagnosis PL-30

Others
PO-19

Others
PO-20

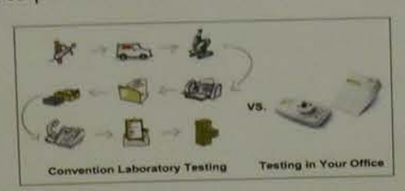
EPBS: POCT - a Challenge for Biomedical Scientists?

Anneke Geurts-Moespot[1, 2], Anne Berndt[1, 3], Sonia Daadoucha-Perroud [1, 4], Barbara Kappeller[1, 5], Paulo Polónio[1, 6], Fernando Mendes [1, 6], Marie Culliton [1, 7].

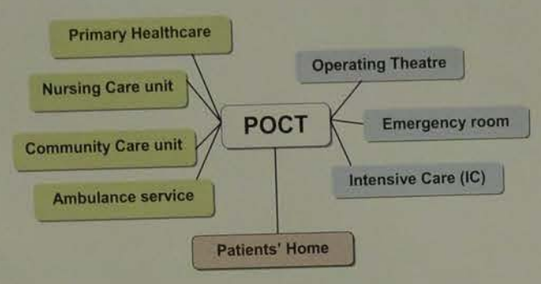
[1]European Association for Professions in Biomedical Sciences, Brussels, Belgium, [2]Nederlandse Vereniging van bioMedisch Laboratoriummedewerkers, Utrecht, Netherlands., [3]Vårdförbundet the Swedish Association of Health Professionals, Stockholm, Sweden, [4]labmed Schweiz Suisse Svizzera, Bern, Switzerland., [5]Biomed Austria - Österreichischer Berufsverband der Biomedizinischen AnalytikerInnen, Vienna, Austria., [6]Superiors Health Technicians in the Area Diagnostic and Therapeutic Union, Porto, Portugal., [7]The Academy of Clinical Science and Laboratory Medicine, Dublin, Ireland.

Point of Care Testing (POCT)

Point of care testing (POCT), also known as near-patient testing or bedside testing, involves collecting specimens and performing biomedical analyses near the patient. It has been one of the most rapidly growing areas in clinical diagnostics worldwide and more and more traditional tests are moving to patient bedside testing.



In practice POCT has not only been carried out at the patients' bedside but at several locations in and outside the hospital where patient care has been delivered.



POCT advantage for the PATIENT

POCT offers quick test results and minimal pre-analytical interference and has so the potential to improve patient outcomes, provided that accuracy and reliability of results have been ensured.

In October 2015 EPBS organized a conference titled:
"**Point of Care Testing: the Patient is the Point**"
in which all aspects of the POCT area were presented:

- POCT in 2015
- Standardization and Regulation of POCT
- POCT Impact on the Health Care System
- Research and Development of New POCT Devices
- Round Table Discussion

BMS in Multidisciplinary teams

With the introduction of POCT it is clear that not only Biomedical Scientists (BMS) are performing the tests, the analyses will mostly be carried out by other health professionals, such as nurses, doctors and doctor's assistants or even by non-health professionals.

BMS have the necessary knowledge, skills and competencies and can play a central role in this new area of multidisciplinary field.

Challenges for BMS

Responsibility for:

- Selection and validation of equipment/device and test
- Education and training of users
- Internal and External quality assurance
- Maintenance
- Record keeping of quality and patient data
- Incident reporting
- Risk Management
- Clinical Audit
- Advice
- Interpretation of data

Conclusion

Patient safety and quality assurance are best addressed by virtue of a multi-disciplinary governance system. Biomedical Scientists within the EPBS have the necessary expertise and competence to take a lead role in ensuring safe and effective governance of POCT and can be a spider in this health care network.

Others

PO-21

EPBS: Facilitating Realisation of a Shared Vision for Biomedical Scientists in Europe.

Marie Culliton [1, 2], Anne Berndt[1, 3], Anneke Geurts-Moespot[1, 4], Sonia Daadoucha-Perroud [1, 5], Barbara Kappeller[1 6], Paulo Polónio[1 7], Fernando Mendes [1, 7]
[1]European Association for Professions in Biomedical Sciences, Brussels, Belgium, [2]The Academy of Clinical Science and Laboratory Medicine, Dublin, Ireland., [3]Vårdförbundet the Swedish Association of Health Professionals, Stockholm, Sweden, [4]Nederlandse Vereniging van bioMedisch Laboratoriummedewerkers, Utrecht, Netherlands., [5]Labmed Schweiz Suisse Svizzera, Bern, Switzerland., [6]Biomed Austria - Österreichischer Berufsverband der Biomedizinischen Analytikerinnen, Vienna, Austria., [7]Superiors Health Technicians in the Area Diagnostic and Therapeutic Union, Porto, Portugal

The European Association for Professions in Biomedical Science (EPBS) represents >60,000 Biomedical Scientists from 21 countries in Europe.
EPBS has adopted the ethics policy of IFBLS and has a Memorandum of Agreement with the IFBLS.

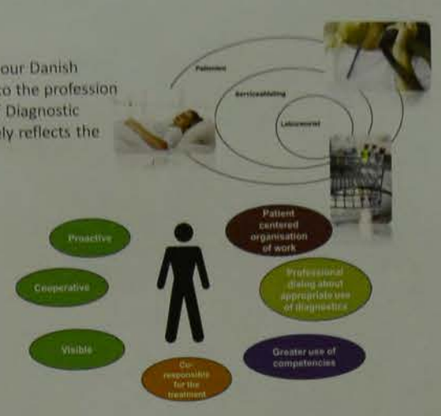
Diagnostic Partner

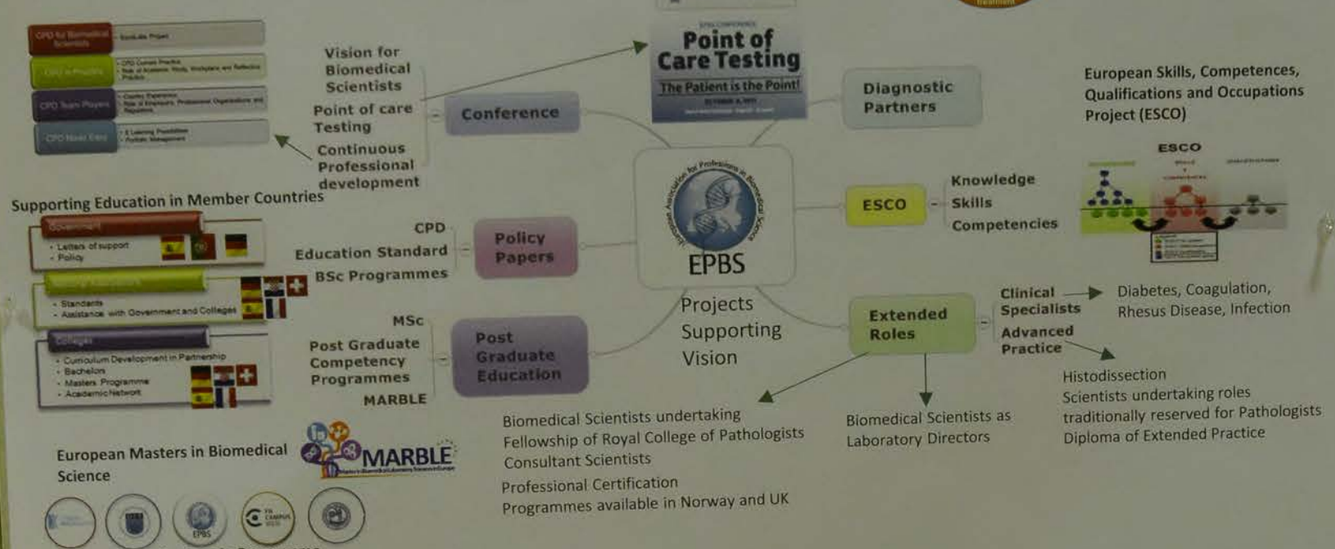
EPBS has developed a shared vision of Biomedical Scientists as Diagnostic Partners in Healthcare, initiated by our Danish colleagues (dbio). To support its members the EPBS has developed a policy on Education Standards for entry to the profession and guidance for educators to transition to that standard. To support Biomedical Scientists to fulfil the role of Diagnostic Partner the EPBS is ensuring that the European ESCO project for knowledge, skills and competencies accurately reflects the entire spectrum of the profession.

Purpose
1. Ensure a better course of treatment of the patient
2.Ensure a central position for biomedical laboratory scientists in the future health care system

Goal
- New areas of work
- New ways of working
- New competencies

The Core Competence
Ensuring the quality of the pre analysis, analysis and post analysis phase





Realising The Shared Vision Through Policy and Programme

Point of Care Testing Policy 2009

Patient safety and quality assurance are best addressed by virtue of a multi-disciplinary governance system
Biomedical Scientists within the European Association for Professions in Biomedical Science (EPBS), have the necessary expertise and competence to take a lead role in ensuring safe and effective governance of POCT. This includes the responsibility for areas such as selection and validation of equipment, education and training of users, internal and external quality assurance, maintenance, record keeping of quality and patient data, incident reporting, risk management and clinical audit, advice and interpretation

Education Policy 2009

The minimum standard of education for Biomedical Scientists acceptable to EPBS is a Bachelor level or 1st cycle (180 -240 ECTS) under the Bologna Process
Progress to higher level degrees of Masters and PhD is an integral part of the Education and Training of Biomedical Scientists

Curriculum for BSc programmes 2015

Explores the first cycle of study examining the general education objectives of the BSc and the minimum knowledge, skills and competencies required of a Biomedical Scientist in modern healthcare.
To assist members, and course directors, a framework curriculum is suggested.
The report links the entry level BSc to the second objective of progress to higher education at Master level (second cycle of Bologna).
Implementing these recommendations will ensure that all members within EPBS will achieve the standard of Level 6 under the European Qualifications Framework. Failure to implement these recommendations will lead to a two tier system which is not in the best interests of patients, public health, health care systems, scientists or governments.

Patronage

EPBS affirms the Conferences of member associations through a Patronage programme. Approved programmes carry the EPBS logo

Continuous Professional Development Policy 2009

CPD is essential for maintaining professional status and enhances the competence of Biomedical Scientists.

EPBS recommends mandatory CPD

Conclusion

The work in EPBS demonstrates how regional interests and needs of Biomedical Scientists can be identified and addressed.
Harnessing our similarities and differences in culture and health care delivery systems we can identify opportunities for the development of our profession.
EPBS policies and activities are focused on supporting and developing Biomedical Scientists in Europe to reach their potential.
This learning can then be used to benefit other regions and contribute to the development of IFBLS.

Others

PO-22

Effects of Different Fungi on Glucose M

PO-22

Chih-man Yang[1,2], Shin Tai [1], Chiu-yen H
[1]Lab, National Taiwan University Hospital Hsin-Chu Br
Bioengineering, National Chiao

ABSTRACT
The incidence of colorectal cancer in advanced countries is very high. In Taiwan, it account target therapy, are to cause cancer cell death, including necrosis, apoptosis, autophagy and inh of Ganoderma sp. and a standard CCRC36021 for mycelium and liquid cultures on colorecta (MTT assay) in different concentrations of culture media. We found that concentration of 30 concentration of 30% and 20% can make more than 90% glucose preservation in 48 hours. significant differences comparing with the control group. **Conclusions and Recommendations** the growth of the HT -29 cell line. We will keep researching the potential anti-tumor effects of G

Introduction

Colorectal cancer, it is with high incidence in advanced countries, including Taiwan. Current cancer treatments include surgery, radiotherapy, chemotherapy and antibody therapy.

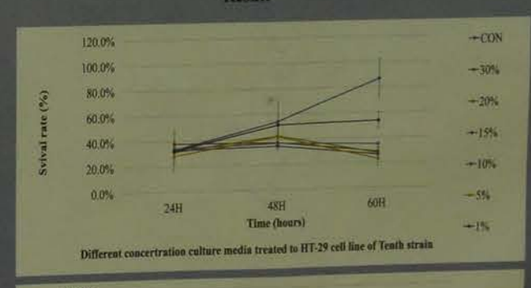
Purpose

To investigate the influences of Ganoderma strains on colorectal cancer HT-29 cells line, and to get a better biological activity strains.

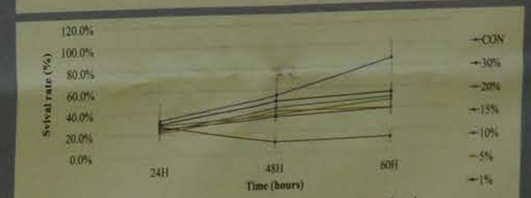
Method

We collected 10 wild strains of Ganoderma lucidum and Standards CCRC36021 mycelium culture strains, which treated with different molecular sieve separation, the culture medium dilutions. Different strains cultured with different concentrations were added to the colorectal cancer cell line HT -29, at different time of incubation. Then, we detected cell proliferation (MTT assay), glucose level and cell morphology.

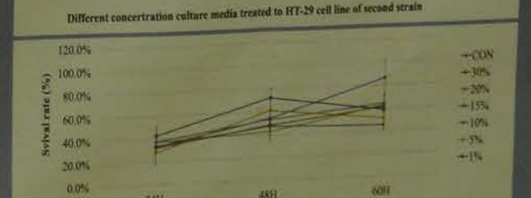
Result



Different concertration culture media treated to HT-29 cell line of Tenth strain



Different concertration culture media treated to HT-29 cell line of second strain



Different concertration culture media treated to HT-29 cell line of 4TH strain

Others
PO-22

Effects of Different Fungi on Glucose Metabolism of HT-29 Cell Line

PO-22

Chih-man Yang[1,2], Shin Tai [1], Chiu-yen Huang[1], Chung-Wei Yang[1,2]
[1]Lab, National Taiwan University Hospital Hsin-Chu Branch, [2]Inst. of Molecular Medicine and Bioengineering, National Chiao Tung University

台大醫院 NTUH Hsin-Chu Branch

ABSTRACT

The incidence of colorectal cancer in advanced countries is very high. In Taiwan, it accounts for top three of cancer mortality. The aims of treatments-chemotherapy and/or target therapy, are to cause cancer cell death, including necrosis, apoptosis, autophagy and inhibition of cell division. In our study, we investigated the effects of six wild strains of Ganoderma sp. and a standard CCRC36021 for mycelium and liquid cultures on colorectal cancer HT-29 cell line. We recorded glucose level, cell proliferation response (MTT assay) in different concentrations of culture media. We found that concentration of 30% in culture media can inhibit glucose utilization and cell growth in 24 hours; concentration of 30% and 20% can make more than 90% glucose preservation in 48 hours. We found the similar findings in different Ganoderma strains and there were significant differences comparing with the control group. **Conclusions and Recommendations**: comparing with the control group, the different Ganoderma strains could inhibit the growth of the HT -29 cell line. We will keep researching the potential anti-tumor effects of Ganoderma strains for the new anti-cancer drugs development.

Introduction

Colorectal cancer, it is with high incidence in advanced countries, including Taiwan. Current cancer treatments include surgery, radiotherapy, chemotherapy and antibody therapy.

Purpose

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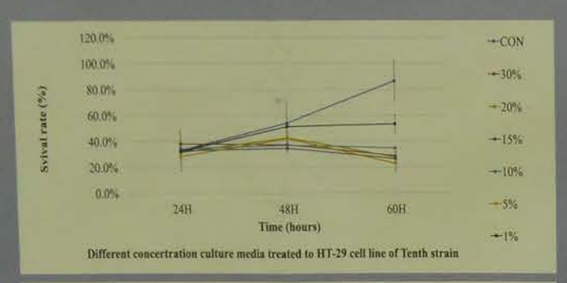
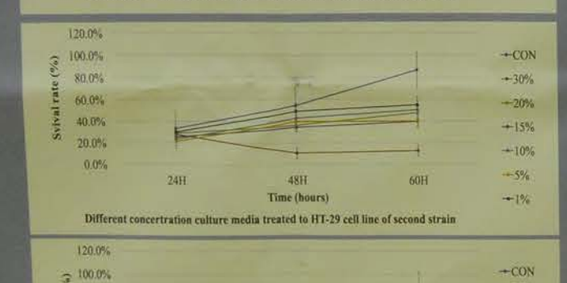
We collected 10 wild strains of Ganoderma lucidum and Standards CCRC36021 mycelium culture strains, which treated with different molecular sieve separation, the culture medium dilutions. Different strains cultured with different concentrations were added to the colorectal cancer cell line HT -29, at different time of incubation. Then, we detected cell proliferation (MTT assay), glucose level and cell morphology.

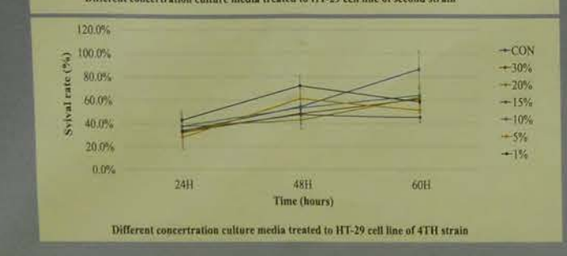
Result



Different concertration culture media treated to HT-29 cell line of Tenth strain



Different concertration culture media treated to HT-29 cell line of second strain



Different concertration culture media treated to HT-29 cell line of 4TH strain

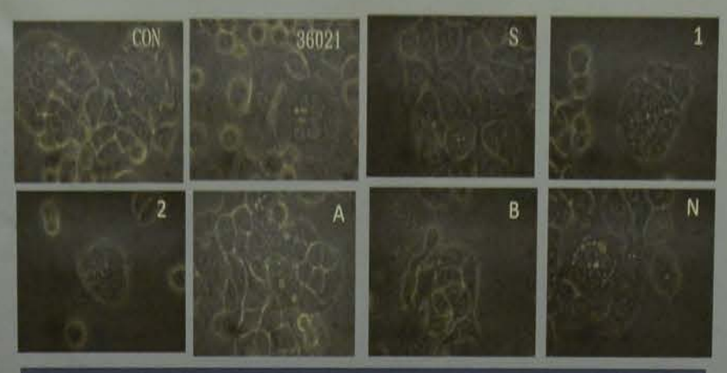


Fig 1. Different strains of media concentration of 30% in 24 hours on the HT-29 cell line.

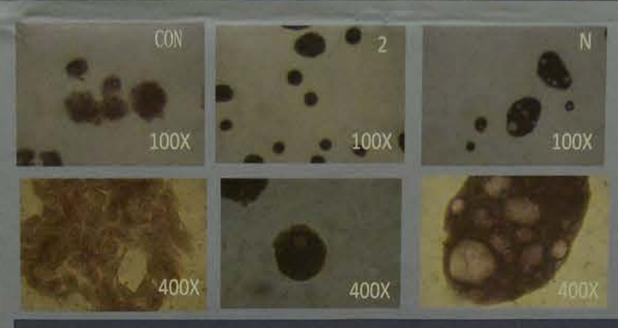
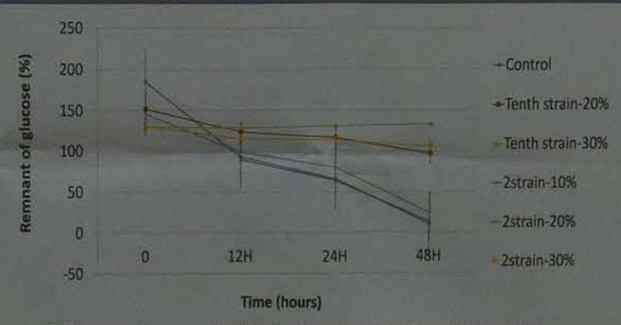


Fig 2. Different strains of media concentration of 30% in 48 hours on the HT-29 cell line.



Different culture media effects glucose metabolism of tow strains

Conclusions

Comparing with the control group, the different Ganoderma strains could inhibit the growth of the HT-29 cell line. We will keep researching the potential anti-tumor effects of Ganoderma strains for the new anti-cancer drugs development.

2016 08 31 IFBLS

Others
PO-24

The Future of Biomedica in Person-centered Care

Michelle Dobos Sandell & Anne Berndt

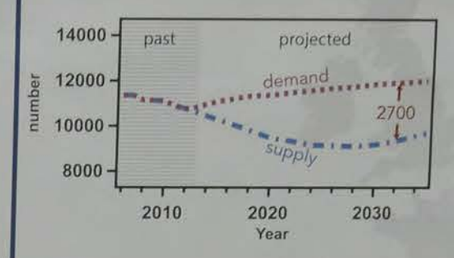
Vårdförbundet* (the Swedish Association of Health Professionals), Stockholm, Swede

*Vårdförbundet is the largest trade union in Swedish health care and organizes four licensed professions; biomedical scientists, midwives, nurses, and radiographers.

Problem

Changes to our understanding and treatment of infectious diseases during the last 150 years has been largely responsible for an additional quarter century to the average European's life expectancy. We are now faced with all new challenges - such as our aging population, increased chronic diseases, increased public expectations, technical possibilities, and spiraling costs. A health care revolution is underway around the globe causing us to rethink the relationships between people and the services that provide their care in order to ensure quality, ethics and sustainability. Person-centered care (PCC) addresses these challenges - encouraging and supporting the individual to more effectively participate in the management and decision making about their own health and health care. In Sweden, retirement of an aging workforce, low enrollment, and high dropout rate is projected to produce a shortage of over 2700 biomedical scientist professionals in 2030 (see box below) and threatens the quality, continuity and safety of patient care. When faced with shortages of licensed biomedical scientists, many employers are opting to hire other life science professionals. While these new recruits may have excellent educations in their fields, they lack the specific competence and training of a biomedical scientist and potentially jeopardize patient care and safety.

Workforce Supply and Demand



Data taken from Trender och Prognoser 2011, Statistics Sweden

Vision

It is the vision of Vårdförbundet for the 21st century and beyond that health care be built on a foundation of collaboration between person seeking care and health care provider, with the ultimate goal of a sustainable, tailored, equitable, person-centered health care. Vårdförbundet sees a new role for biomedical scientists - as diagnostic partners paramount for ensuring patient safety, efficient use of resources and whose knowledge and competence is sought by the other members of the care team. In Sweden, biomedical scientists are educated to be working in either biomedical laboratory medicine or clinical physiology.

Conclusion

Which of today's tasks can be done by others and which require the biomedical scientist's skills? When biomedical scientists' knowledge and skills are used properly, in teams where decisions are made, society/health care has much to gain. Profits by enhancing the quality, reduction in re-testing resulting in fewer trips to the hospital/clinic for the patient, fewer medical errors and misdiagnosis. This makes health care more accessible and efficient.

As a diagnostic partner, a biomedical scientist is a more present and proactive partner in the health care teamwork. Through technical knowledge, experience and communication skills, contributions are given to the health care team, providing support in diagnostics and follow-up of patients. A conscious leadership is needed to recognize the benefits biomedical scientists bring to the health care team and who can organize and integrate their work, perhaps finding new roles to give maximum effect. Sweden is at the brink of a pervasive reorientation of health care towards person-centered care, which will result in a sustainable, coordinated, coherent health care in which the biomedical scientist will play a central role.

Person-c

- A person-centered redefining the con a passive recipient motives and resou in a person's ***narra***
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- PCC is a ***partnershi*** and the health care fosters a mutual resp knowledge of thems health professional's disease, care, treatm
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- The World Health Orga a global strategy on in people-centred health and is also working for paradigm shift in the w are funded, managed a

Contact
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Vårdförbundet, Stockholm, S
Email: michelle.dobos.sandell

Biomedical

European Skills, Competences, Qualifications and Occupations Project (ESCO)

ESCO

Diabetes, Coagulation, Rhesus Disease, Infection

Histodissection
Scientists undertaking roles traditionally reserved for Pathologists
Diploma of Extended Practice

Point of Care Coordinator

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5 recommends mandatory CPD

ment of our profession.

Others
PO-24

Others
PO-25

The Future of Biomedical Scientists in Person-centered Care

Michelle Dobos Sandell & Anne Berndt

Vårdförbundet* (the Swedish Association of Health Professionals), Stockholm, Sweden

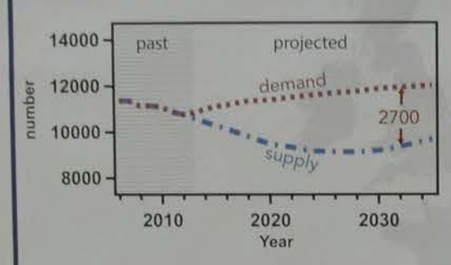
*Vårdförbundet is the largest trade union in Swedish health care and organizes four licensed professions; biomedical scientists, midwives, nurses, and radiographers.

VÄRDFÖRBUNDET

Problem

Changes to our understanding and treatment of infectious diseases during the last 150 years has been largely responsible for an additional quarter century to the average European's life expectancy. We are now faced with all new challenges - such as our aging population, increased chronic diseases, increased public expectations, technical possibilities, and spiraling costs. A health care revolution is underway around the globe causing us to rethink the relationships between people and the services that provide their care in order to ensure quality, ethics and sustainability. Person-centered care (PCC) addresses these challenges - encouraging and supporting the individual to more effectively participate in the management and decision making about their own health and health care. In Sweden, retirement of an aging workforce, low enrollment, and high dropout rate is projected to produce a shortage of over 2700 biomedical scientist professionals in 2030 (see box below) and threatens the quality, continuity and safety of patient care. When faced with shortages of licensed biomedical scientists, many employers are opting to hire other life science professionals. While these new recruits may have excellent educations in their fields, they lack the specific competence and training of a biomedical scientist and potentially jeopardize patient care and safety.

Workforce Supply and Demand



Data taken from Trender och Prognoser 2011, Statistics Sweden

Vision

It is the vision of Vårdförbundet for the 21st century and beyond that health care be built on a foundation of collaboration between person seeking care and health care provider, with the ultimate goal of a sustainable, tailored, equitable, person-centered health care. Vårdförbundet sees a new role for biomedical scientists - as diagnostic partners paramount for ensuring patient safety, efficient use of resources and whose knowledge and competence is sought by the other members of the care team. In Sweden, biomedical scientists are educated to be working in either biomedical laboratory medicine or clinical physiology.

Conclusion

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As a diagnostic partner, a biomedical scientist is a more present and proactive partner in the health care teamwork. Through technical knowledge, experience and communication skills, contributions are given to the health care team, providing support in diagnostics and follow-up of patients. A conscious leadership is needed to recognize the benefits biomedical scientists bring to the health care team and who can organize and integrate their work, perhaps finding new roles to give maximum effect. Sweden is at the brink of a pervasive reorientation of health care towards person-centered care, which will result in a sustainable, coordinated, coherent health care in which the biomedical scientist will play a central role.

Person-centered Care

- A person-centered approach requires redefining the concept of the patient from a passive recipient to a person with wills, motives and resources which are identified in a person's ***narrative***.
- The extended health care team ensures care and rehabilitation are integrated and coordinated based on the person, the person's network and ***context***.
- PCC is a ***partnership*** between the person and the health care provider. Partnership fosters a mutual respect for the person's knowledge of themselves and for the health professional's knowledge of the disease, care, treatment and rehabilitation.
- PCC, requires cooperation & collaboration between all professions in the health care team on equal terms. Here biomedical scientists, with their specialized knowledge can play a key role.
- The World Health Organization (WHO) has a global strategy on integrated people-centred health services (IPCHS) and is also working for a fundamental paradigm shift in the way health services are funded, managed and delivered.

Example 1

Three regional health care employers, Region Skåne, Västerbotten County Council and Dalarna County Council have introduced a new structure called the Laboratory Medicine Council consisting of biomedical scientists. This is a collaboration between central laboratory medicine and primary health care. The biomedical scientist as point of care testing (POCT)-coordinator, is responsible for decision-making throughout the entire analytical process. To compensate for lost resources, phlebotomy and POCT in primary health care is performed by nurse's assistants. Quality control and all education of this category is provided by biomedical scientists.

Results

The 3 Laboratory Medicine Councils have improved health care in their regions through:

- Better dialogue between laboratory medicine and primary health care
- Support for optimal use of resources
- Procurement of and selection of instrumentation is made by biomedical scientists
- POCT instruments are programmed to allow access only by trained and continuously recertified staff
- Identification of need and provision of education to non-licensed staff involved with POCT

Example 2

In 2014, the County Council of Blekinge established a number of specialist positions for biomedical scientists in clinical physiology. It was identified that the work performed by some very experienced or master degree holding biomedical scientists overlapped that performed by resident physicians. In addition to new work titles, the responsibility and most importantly, salary, of the new position holders was increased

Results

Through the new role of specialist biomedical scientists, health care in the County Council of Blekinge is improved by:

- Development and personalization of examinations
- More effective and time-efficient health care
- Improved knowledge sharing between the clinical physiology and the clinics
- Cost-effective, as the right knowledge is used
- Clarity of mission
- Better accessibility to health care
- Easier staff recruitment

Contact

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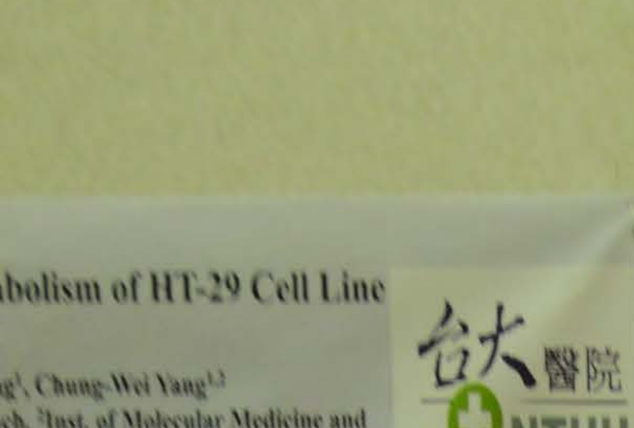
bolism of HT-29 Cell Line

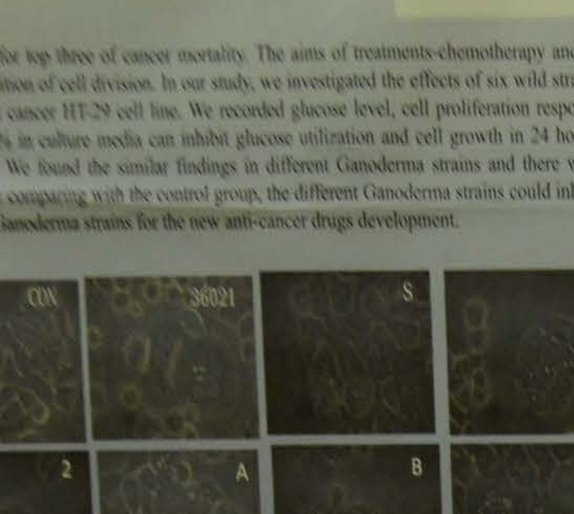
g[1], Chung-Wei Yang[1,2]
ch, [2]Inst. of Molecular Medicine and
ng University

台大醫院 NTUH Hsin-Chu Branch

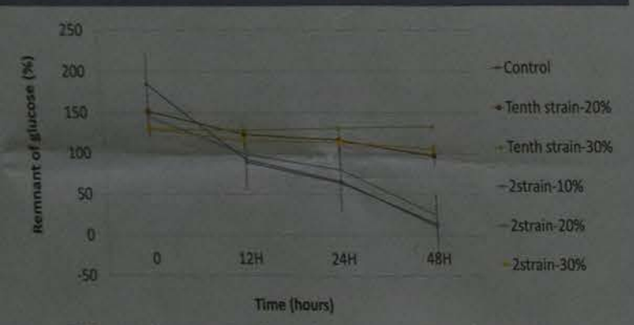
for top three of cancer mortality. The aims of treatments-chemotherapy and/or ition of cell division. In our study, we investigated the effects of six wild strains cancer HT-29 cell line. We recorded glucose level, cell proliferation response % in culture media can inhibit glucose utilization and cell growth in 24 hours; We found the similar findings in different Ganoderma strains and there were comparing with the control group, the different Ganoderma strains could inhibit Ganoderma strains for the new anti-cancer drugs development.



different strains of media concentration of 30%, in 24 hours on the HT-29 cell line.



g 2. Different strains of media concentration of 30% in 48 hours on the HT-29 cell line.



Different culture media effects glucose metabolism of tow strains

Conclusions

Comparing with the control group, the different Ganoderma strains could inhibit the growth of the HT-29 cell line. We will keep researching the potential anti-tumor effects of Ganoderma strains for the new anti-cancer drugs development.

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Over the past decades we h
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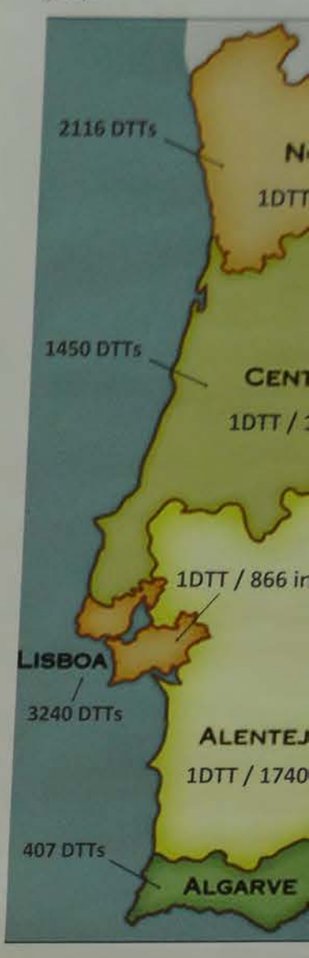


Changes in procurement policies over t
age group. The largest number of profe
most desertified areas with a lower ratio

[1] – Central Administration of Health System, ACSS (data based on

Others
PO-25

Health technologies in Portugal, number and geographical distribution

Fernando Mendes [1,2], Diana Nogueira [1,3], Lucília Vicente [1,4], Paulo Polónio [1,5], Almerindo Rego [1]

1 –Sindicato Nacional dos Técnicos Superiores de Saúde na Área do Diagnóstico e Terapêutica,Porto,Portugal; 2-Inst Politec Coimbra,ESTeSC -Coimbra Health School, Department of Biomedical Laboratory Sciences, Coimbra Portugal; 3 – Laboratório de Patologia Clínica, Centro Hospitalar de S. João Porto. Porto, Portugal; 4- Centro Hospitalar do Algarve- Unidade de Portimão E.P.E. Portimão, Portugal; 5 – Laboratório de Medicina Laboratorial, Hospital Distrital da Figueira da Foz, E.P.E., Figueira da Foz, Portugal.

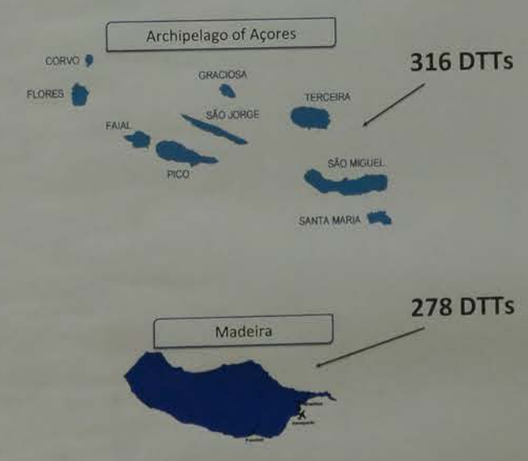
Over the past decades we have register changes in the redistribution of health resources, trying to keep up with the population distribution of asymmetries. According to the World Health Organization (WHO), all people should be able to reach their full health potential, without the economic and social circumstances of each determine to achieve this objective. Geographical distribution is made according to the 5 Coordination Committees and Regional Development (CDDR) defined in continental Portugal and the Açores and Madeira.

The total number of Diagnostic and Therapeutic Technician (DTT) in 2014 was 8353, and its national distribution 1 DTT/ 1214 inhabitants which in area means 1DTT by each 10 Km^2. In Portugal the Biomedical Laboratory Scientists are included in this group.

The number of ♂ Biomedical Laboratory Scientists, in Portugal is only 1/6 of the entire group of professionals

DTT by age and continental regions [1]	0-29	30-39	40-49	50-59	60-64	65+
Alentejo	67	205	104	52	17	1
Algarve	62	195	84	52	10	4
Centro	121	505	522	250	48	4
Lisboa e Vale do Tejo	365	1179	1006	566	115	9
Norte	246	890	666	358	51	5

Age Group								
2011	*1661*	*2702*	*2259*	*1138*	*203*		*307*	*276*
2012	*1468*	*2721*	*2299*	*1140*	*225*		*310*	*250*
2013	*990*	*2861*	*2330*	*1234*	*284*	*21*	*301*	*271*
2014	*861*	*2974*	*2382*	*1278*	*241*	*23*	*316*	*278*



Changes in procurement policies over the past four years have resulted in a reduction of working professionals in the lower age group. The largest number of professionals is concentrated in large urban centres, not coming as a surprise that the most desertified areas with a lower ratio of DTT per capita, leaving open the maximum WHO.

(1) – Central Adminstration of Health System, ACSS (data based on a report publish in 2014)

Others
PO-26

The Philippines is known for its biodiversity cau
nematophagous fungi that are found environme
kill, and digest nematodes (Norbring-Hertz, 20
collected soil samples and record their trappin
1.5% water agar along with embryonated Asca
after inoculation. Eight percent (8%) of the soil
further purified by spore touch method in new p
trapping mechanisms of the fungi. The nemato
recovered images were used to describe in de
the plated media, color of the colony, and char
Arthrobotrys spp.

Keywords: Nematode-trapping, fungi, *Ascaris l*

INTRODUCTION

Many species of fungi have be
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(Morris et. al., 2014). These f
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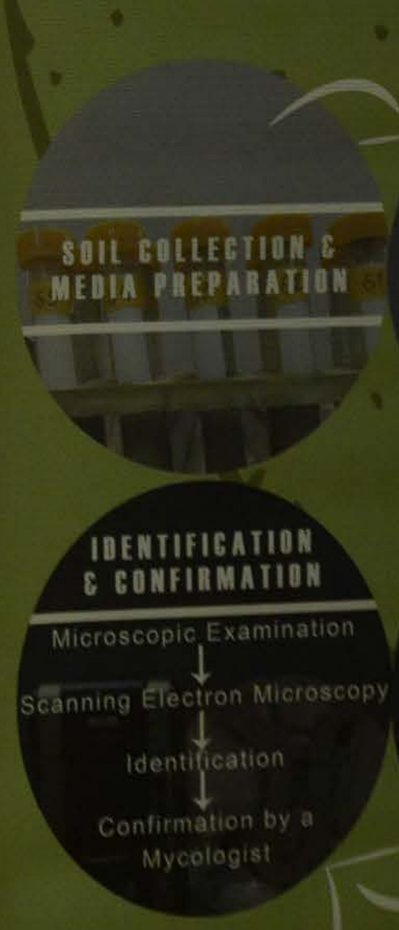
METHODOLOG



Based on the morph
identified as *Arthrobo*
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Others

PO-26

DETECTION AND ISOLATION OF NEMATOPHAGOUS FUNGI IN PHILIPPINE SOIL

BONSOL, A.L.DL.[1], BORJA, M.B.R.[1], CARINGAL, C.A.E.[1], GASPAR, F.R.H.[1], NAVARRO, L.A.A.[1], RAMOS, S.J.G.[1], SANTIAGO, S.J.C.[1], MARTIN I, G.L.[1]
[1]DEPARTMENT OF MEDICAL TECHNOLOGY, FACULTY OF PHARMACY, UNIVERSITY OF SANTO TOMAS

ABSTRACT

The Philippines is known for its biodiversity caused by its tropical climate making the land inhabitable to different forms of life. Some of which are nematophagous fungi that are found environmentally and can be isolated from the soil. Nematophagous fungi are microfungi that can capture, kill, and digest nematodes (Norbring-Hertz, 2011). The objective of this study was to detect and isolate nematophagous fungi from locally collected soil samples and record their trapping activity. For the isolation of fungi, soil samples were directly inoculated onto Petri dishes with 1.5% water agar along with embryonated Ascaris lumbricoides eggs as bait. The nematode-trapping activity of the fungi was observed 1 week after inoculation. Eight percent (8%) of the soil samples (n=26) demonstrated fungi with nematode trapping activity. The positive samples were further purified by spore touch method in new plated media containing Sabouraud dextrose agar. Ascaris eggs were added again to trigger the trapping mechanisms of the fungi. The nematophagous activity of the fungi was further visualized under a scanning electron microscope. The recovered images were used to describe in detail to completely identify the specie isolated. Initial identification based on the growth pattern in the plated media, color of the colony, and characteristic appearance of the isolated conidia revealed that the organism isolated was part of the Arthrobotrys spp.

Keywords: Nematode-trapping, fungi, *Ascaris lumbricoides*

INTRODUCTION

Many species of fungi have been found to be antagonistic or parasitic toward nematodes and their eggs, often using them for nutrition (Morris et. al., 2014). These fungi include the nematode-trapping or nematophagous fungi, which have specific hyphal structures capable of trapping and digesting nematodes (Andersson et. al., 2014). Nematophagous fungi are a viable and promising alternative to chemical parasiticides, and can be an option in controlling gastrointestinal nematodes of humans and domestic animals (Silva et. al., 2010).

OBJECTIVES

The main goal of this study is to isolate and detect nematophagous fungi from the different Philippine soils.

The specific objectives are as follows:

1. Locate possible sources of nematophagous fungi.
2. Determine the nematode-trapping activity of the fungi
3. Identify the isolated nematopagous fungi.

METHODOLOGY

RESULTS & DISCUSSION

Eight percent (8%) of the soil samples (N=26) demonstrated the presence of nematophagous fungi. The nematode trapping activity of the fungi was observed 1 week after inoculation. The larvae were seen immobilized by root-like structures with the presence of spores nearby. Scanning Electron Microscope (SEM) was used to visualize the nematophagous activity of the fungi. According to a mycologist, the characteristic of the spores isolated revealed that the fungi isolated belong to the genus *Arthrobotrys*.

Figure 1. Imaging of spores of a nematophagous fungi. (A) Arrow denotes spores under the Light Microscope using low power objective (100x). The spores revealed a distinct bulb-shape appearance. (B) Spore under SEM with a length of 25.7 um (imaged at 15 kV, 1000x). (C) Spore under SEM with a width of 9.87 um (imaged at 15 kV, 1000x).

Figure 2. Imaging of hyphae of nematophagous fungi. (A) Hyphae under Light Microscope using scanner objective (40x). (B) The hyphae of the fungi under SEM revealed a root-like structrure appearance with the presence of septate (imaged at 5kV, 1000x) (arrows). (C) The septated hypha with a length of 18.4 um (imaged at 5kV, 1500x). Arrows denotes the presence of septa.

Figure 3. Imaging of trapped nematode larvae. (A) Immobilized larvae visualized under a Light Microscope using low power objective (100x). Arrow denotes the root-like structures that were seen around the larvae. (B) Trapped larva under SEM (imaged at 5kV, 600x). (C) Arrow denotes the trapping activity of the fungi (imaged at 5kV, 1000x).

CONCLUSION

Based on the morphology of the spores, the fungal isolate was initially identified as *Arthrobotrys* spp. Its detection demostrates that the Philippine soil is a viable source of nematophagous fungi. The ability of the fungi to trap and digest nematodes shows its potential as a biologic control for soil-inhabiting nematodes.

RECOMMENDATIONS

The researchers recommend comparing the results of the study using soil samples and leaf litters. Also, the researchers recommend using different isolation techniques for nematophagous fungi. The demonstration of nematode-trapping activity of the fungi using other roundworms and an in depth study of the factors that may affect the growth of the nematophagous fungi are also recommended.

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Silva, A., Araujo, J., Braga, F., Alves, C., &Frassy, L. (2012).In vitro ovicidal activity of the nematophagous fungi *Duddingtoniaflagrans*, *Monacrosporiumthaumasium* and *Pochoniachlamydosporia* on *Trichurisvulpis* eggs. Veterinary Parasitology, 172, 76-79.

gies in Portugal,
aphical distribution

Vicente [1-4], Paulo Polónio [1,3], Almerindo Rego [1]

Portugal; 2-Inst Politec Coimbra,ESTeSC -Coimbra Health School, Department of Biomedical S. João Porto, Porto, Portugal; 4- Centro Hospitalar do Algarve -Unidade de Portimão E.P.E. , E.P.E., Figueira da Foz, Portugal.

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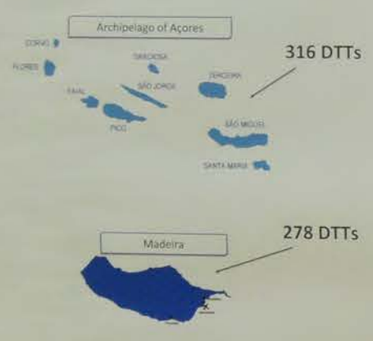

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Others

PO-27

ANTIB
EPIDERM

KIM G SARONG,
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The antibacterial activities of epidermal mucus in crude pathogenic bacteria (*Escherichia coli, Pseudomonas* inhibition and Minimum Inhibitory Concentration (MIC), Hinton Agar plates together with mucus impregnated hours of incubation. Gram Staining was also perfor inoculated into Mueller Hinton Broth to determine the largest average zones of inhibition followed by *S. dimi* by *E. coli* and *S. aureus*. Gram staining results sugge present in fish mucus were not. None of the tubes turne to 1) the presence of other bacteria inherently preser these findings, it can be concluded that the epidermal *aeruginosa* and *S. aureus* and thus play an important

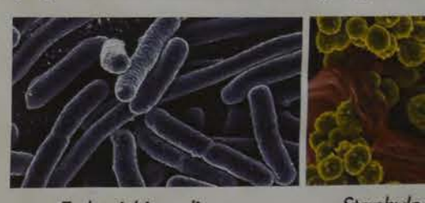
Keywords: Antibacterial, Fish epidermal mucus, Parrotf

FRAMEWO

1. Pre-Data Collection

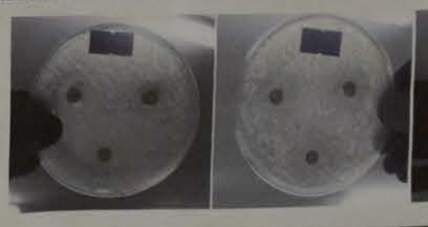
Scarus dimidiatus *Scarus bleekeri*

3. Culture of *Escherichia coli, Pseudomona* *Staphylococcus aureus* and Impregnatio



Escherichia coli *Staphyloc*

4. Measurement of the Zone of Inhibition a



TREATMENT	*Escheric coli*
Scarus dimidiatus	18.67
Scarus bleekeri	18.00
Scarus psittacus	21.67
Positive Control (Ampicillin)	17.62
Positive control (Gentamicin)	-
Positive Control (Penicillin)	-
Negative Control	6

C

The study showed that the epidermal mucus of *Scarus* pathogenic bacteria -- *Escherichia coli, Pseudomonas aer* against invading pathogens. The results imply that fish mu treatment against common pathogens such as the 3 bacte

RECO

PRACTICAL

1. the Bureau of Fisheries and Aquatic Resources (BFAR) shou of fish especially those found in the Philippines.

2. Pharmaceutical companies should also explore the aqua human pathogens.

THEORETICAL RECOMMENDATIONS

1. fresh Parrotfish should be collected during night time as thi cocoon made of mucus secreted from an organ in their head,

2. the epidermal fish mucus of parrotfish should be filtered or mucus. If the instruments and machines are available, it is compositions of the isolated mucus should be performed; and

3. different treatments for the epidermal mucus should also be and compare their effects against pathogenic bacteria.

REF

Kuppulakshmi, C., Prakash, M., Gunasekaran, G., Manimegala *Channa punctatus* and *Cirrhinus mrigala*. *European Review* Loganathan, K., Muniyan, Prakash, A., Senthil, Raja, P., & Praka against selected microbes. *International Journal of Pharmac* Wei, O., Xavier, R., & Marimuthu, K. (2010). Screening of anti (bloch). *European Review for Medical and Pharmacologica*

Others
PO-27

ANTIBACTERIAL ACTIVITY OF FISH EPIDERMAL MUCUS FROM PARROTFISH

KIM G SARONG, ESTHER NACITA, DINAH BELLE ABONG, MARC DANIEL NISPEROS, DANIEL G SARTE, QUENNIE TORALDE, PRETTY VILAR

INSTITUTE OF CLINICAL LABORATORY SCIENCES, SILLIMAN UNIVERSITY, PHILIPPINES

ABSTRACT

The antibacterial activities of epidermal mucus in crude extract from *Scarus dimidiatus, Scarus bleekeri* and *Scarus psittacus* against three pathogenic bacteria (*Escherichia coli, Pseudomonas aeruginosa* and *Staphylococcus aureus*) were tested by determining the zone of inhibition and Minimum Inhibitory Concentration (MIC). Stock cultures of the microorganisms were sub-cultured and procured into Mueller Hinton Agar plates together with mucus impregnated filter paper. The diameter of each zone of inhibition was measured after 16-18 hours of incubation. Gram Staining was also performed and bacterial cultures, diluted into 4-fold steps, and 0.2 ml of mucus were inoculated into Mueller Hinton Broth to determine the MIC. Test for significance of difference demonstrated that *S. psittacus* exhibited the largest average zones of inhibition followed by *S. dimidiatus* and *S. bleekeri*. *P. aeruginosa* was the most susceptible to fish mucus followed by *E. coli* and *S. aureus*. Gram staining results suggest that the three bacteria were successfully inhibited but the bacteria intrinsically present in fish mucus were not. None of the tubes turned clear for the measurement of the MIC. The turbidity observed was most likely due to 1) the presence of other bacteria inherently present, 2) the mucus used was not purified; and 3) the mucus was already turbid. With these findings, it can be concluded that the epidermal mucus of *S. dimidiatus, S. bleekeri* and *S. psittacus* inhibits the growth of *E. coli, P. aeruginosa* and *S. aureus* and thus play an important role in fish against invading pathogens.

Keywords: Antibacterial, Fish epidermal mucus, Parrotfish

FRAMEWORK, MATERIALS & METHODS

1. Pre-Data Collection

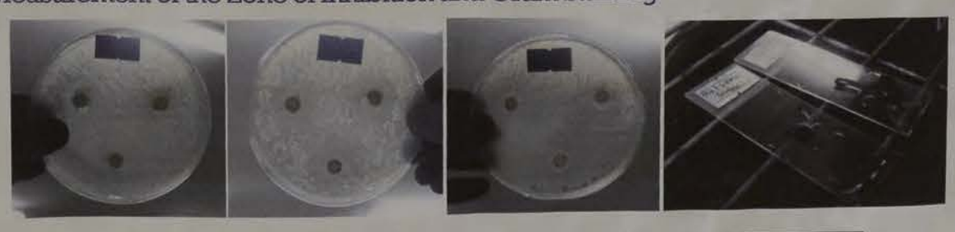
Scarus dimidiatus *Scarus bleekeri* *Scarus psittacus*

2. Collection of Mucus and Preparation of Crude Extract

3. Culture of *Escherichia coli, Pseudomonas aeruginosa* and *Staphylococcus aureus* and Impregnation of Mucus Samples

Escherichia coli *Staphylococcus aureus* *Pseudomonas aeuruginosa*

4. Measurement of the Zone of Inhibition and Gram Staining



TREATMENT	AVERAGE ZONE OF INHIBITION (mm)		
	Escherichia coli	*Staphylococcus aureus*	*Pseudomonas aeuruginosa*
Scarus dimidiatus	18.67	20.67	15.33
Scarus bleekeri	18.00	17.67	11.33
Scarus psittacus	21.67	22.67	17.33
Positive Control (Ampicillin)	17.62		-
Positive control (Gentamicin)	-	23.33	-
Positive Control (Penicillin)	-	-	27.33
Negative Control	6	6	6

CONCLUSION

The study showed that the epidermal mucus of *Scarus dimidiatus, Scarus bleekeri* and *Scarus psittacus* inhibits the growth of 3 pathogenic bacteria -- *Escherichia coli, Pseudomonas aeruginosa* and *Staphylococcus aureus* and thus play an important role in fish against invading pathogens. The results imply that fish mucus could thus be regarded as a potential means for alternative source of treatment against common pathogens such as the 3 bacteria tested in this study.

RECOMMENDATIONS

PRACTICAL

1. the Bureau of Fisheries and Aquatic Resources (BFAR) should conduct a confirmatory study on this research, and test different species of fish especially those found in the Philippines.

2. Pharmaceutical companies should also explore the aquatic field as source of sustainable antibacterial agents against susceptible human pathogens.

THEORETICAL RECOMMENDATIONS

1. fresh Parrotfish should be collected during night time as this is where they spend up to an hour wrapping themselves in a transparent cocoon made of mucus secreted from an organ in their head, therefore substantial amounts of mucus can be obtained;

2. the epidermal fish mucus of parrotfish should be filtered and purified to eliminate intrinsic pathogens and contaminants present in the mucus. If the instruments and machines are available, it is also recommended that analysis and characterization of the chemical compositions of the isolated mucus should be performed; and

3. different treatments for the epidermal mucus should also be prepared-- most notably acidic, aqueous and saline extracts to determine and compare their effects against pathogenic bacteria.

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Wei, O., Xavier, R., & Marimuthu, K. (2010). Screening of antibacterial activity of mucus extract of snakehead fish, *Channa striatus* (bloch). *European Review for Medical and Pharmacological Sciences, 14*, 675- 681.

Others
PO-28

ABSTRACT

Cancer remains one of the leading causes of deaths worldw
With the use of antimicrobial peptides, such as bacteriocin, to t
further investigation and clinical trials. Crude Bacteriocin was e
ammonium sulphate and t-butanol. Its antimicrobial activity was
with the widest zone of inhibition, was lyophilized, and tested its
the MTT bioassay, the cells were treated with bacteriocin at c
obtained at different concentrations were used to compute for
concentration of bacteriocin at 15.63 µg/mL is cytotoxic to 53
acceptable concentration of doxorubicin HCl, the positive contro
Lactobacillus acidophilus could be employed as a potential an
15.63 µg/mL.

Keywords: *Lactobacillus*, bacteriocin, breast cancer

INTRODUCTION

According to Philippine Society of Medical Oncology, breast
isease associated with age and heredity, has been known to
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2010). Accounting for 28% of the total cases of cancer. The incid
isease makes the discovery and improvement of new anticance
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Bacteriocin is one of the antimicrobial peptides produced by *L*
which exhibits bactericidal or bacteriostatic activities which are letha
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his research.

METHODOLOGY

Culture of samples

Acquiring the *L.acidophilus* sample from RCNAS
Gram staining the isolated colony
Subculturing to broth to get a pure colony

Extraction and purification of isolates

Ammonium sulfate precipitation
Addition of t-butanol

Preliminary screening

Agar Well method

Lyophilization

Testing for cytotoxic activity

MTT Bioassay

CONCLUSION AND RECOMMENDATION

CONCLUSION:

In the result of the experimentation, the bacteriocin extracted from *Lactobacillus acidop*
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ositive control (Doxorubicin HCl) at 20.00 µg/mL. Based on the data and computations obta
e more cytotoxic activity it has against breast cancer cells.

ECOMMENDATION:

The following are recommended for future work:

1. A study on bacteriocin producing bacteria
2. Capability of bacteriocin in inhibiting the growth of other cancer cell lines through MTT bioassay.
3. Determine the cytotoxicity of the bacteriocin against fibroblasts.
4. Test the anti-microbial of bacteriocin d with other pathogens other than what this study had used
5. Research on the different uses of bacteriocin in the field of medicine and drug industry.
6. Perform SDS page to be to identify Bacteriocin from *Lactobacillus acidophilus* in order to increase the

EFERENCES

Askoul, L., Gorrah, S., & Al-Amir, L. (2014). Isolation and Characterization of Bacteriocin Produc. *International Journal of*

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L ACTIVITY OF FISH
US FROM PARROTFISH

INAH BELLE ABONG, MARC DANIEL NISPEROS,
ENNIE TORALDE, PRETTY VILAR

Y SCIENCES, SILLIMAN UNIVERSITY, PHILIPPINES

T

inidiatus, *Scarus bleekeri* and *Scarus psittacus* against three *ococcus aureus*) were tested by determining the zone of croorganisms were sub-cultured and procured into Mueller eter of each zone of inhibition was measured after 16-18 ures, diluted into 4-fold steps, and 0.2 ml of mucus were of difference demonstrated that *S. psittacus* exhibited the *aeruginosa* was the most susceptible to fish mucus followed ria were successfully inhibited but the bacteria intrinsically nent of the MIC. The turbidity observed was most likely due s not purified; and 3) the mucus was already turbid. With *S. bleekeri* and *S. psittacus* inhibits the growth of *E. coli*, *P.* ding pathogens.

S & METHODS

2. Collection of Mucus and Preparation of Crude Extract

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d
les

Pseudomonas aeuruginosa

g

ONE OF INHIBITION (mm)

coccus us	*Pseudomonas aeuruginosa*
7	15.33
7	11.33
7	17.33
	-
3	-
	27.33
	6

SION

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Others

PO-28

IN VITRO CYTOTOXIC ACTIVITY OF PURIFED BACTERIOCIN EXTRACTED FROM *LACTOBACILUS ACIDOPHILUS* AGAINST BREAST CANCER CELL LINE

AGAD, R.A.N.A', CANO, E.A.A', CORTEZ,K.R.D', FLORENDO,J.D.V.',
GONZALES,A.C.A.,'YU,P.D.M.S.','YUAGA,J.T.S.',MARTIN,I.G.L.;'
'DEPARTMENT OF MEDICAL TECHNOLOGY, FACULTY OF PHARMACY,
UNIVERSITY OF SANTO TOMAS

ABSTRACT

Cancer remains one of the leading causes of deaths worldwide (Ngoma, 2006), despite advances in its treatment and detection. With the use of antimicrobial peptides, such as bacteriocin, to treat cancer is a new approach and could be a promising candidate for further investigation and clinical trials. Crude Bacteriocin was extracted from *Lactobacillus acidophilus*, and was purified by means of ammonium sulphate and t-butanol. Its antimicrobial activity was tested by performing the agar well diffusion method, and the sample with the widest zone of inhibition, was lyophilized, and tested its cytotoxic activity against Breast Cancer cell, using the MTT bioassay. In the MTT bioassay, the cells were treated with bacteriocin at concentrations of 200, 100, 50, 25, and 12.5 µg/mL. The absorbance obtained at different concentrations were used to compute for IC_{50} of bacteriocin and doxorubicin HCl. From the observations, the concentration of bacteriocin at 15.63 µg/mL is cytotoxic to 53.67% of the breast cancer cells, which is lower than the standard acceptable concentration of doxorubicin HCl, the positive control, is 20 µg/mL. Based from the results obtained, the bacteriocin from *Lactobacillus acidophilus* could be employed as a potential antimicrobial agent and is cytotoxic to 53.67% of the cancer cells at 15.63 µg/mL.

Keywords: *Lactobacillus*, bacteriocin, breast cancer

INTRODUCTION

According to Philippine Society of Medical Oncology, breast cancer is a disease associated with age and heredity, has been known to have a high incidence among Asian women, based on the study conducted by Shin, et al (2010). Accounting for 28% of the total cases of cancer. The incidence of this disease makes the discovery and improvement of new anticancer drug and therapy a focus in research.

Bacteriocin is one of the antimicrobial peptides produced by *Lactobacillus*, which exhibits bactericidal or bacteriostatic activities which are lethal to bacteria other than its producing strain (Askoul, Gorrah, & Al– Armir, 2014). Researches showed that bacteriocins can be used as a potential therapeutic agent (Lancaster, Wintermeyer, & Rodnina, 2007) because of its ability to inhibit membrane protein and DNA synthesis, antiviral properties, and cytotoxic activity against tumor cells. Of these biological functions, cytotoxic activity against tumor cells gives an interesting premise in field of medicine and is the focus of this research.

OBJECTIVES

The general objective of this study was to test the cytotoxic activity of purified bacteriocin against breast cancer cell line using the MTT Bioassay.

The specific objectives are the following:

1. To extract and purify bacteriocin from lactic acid bacteria through ammonium sulfate precipitation;
2. To determine the antimicrobial activity of bacteriocin against various pathogens.

METHODOLOGY

Culture of samples

Acquiring the *L.acidophilus* sample from RCNAS
Gram staining the isolated colony
Subculturing to broth to get a pure colony

Extraction and purification of isolates

Ammonium sulfate precipitation
Addition of t-butanol

Preliminary screening

Agar Well method

Lyophilization

Testing for cytotoxic activity

MTT Bioassay

RESULTS AND DISCUSSION

In the MTT bioassay, the cells were treated with bacteriocin at concentrations of 200, 100, 50, 25, and 12.5 µg/mL. The absorbance obtained at different concentrations were used to compute for IC_{50} of bacteriocin and Doxorubicin HCl (Refer to Table 1).

Table 1. Bacteriocin: Cell Viability and Cell Cytotoxicity

PARAMETER		Absorbance			Percentage Cell Viability			Cell Cytotoxicity		
		1st trial	2nd trial	3rd trial	1st trial	2nd trial	3rd trial	1st trial	2nd trial	3rd trial
Untreated Control		1.06	1.02	1.12						
Bacteriocin Sample	200 µg/mL	0.38	0.38	0.38	35.39%	37.00%	33.76%	64.61%	63.00%	66.24%
	100 µg/mL	0.39	0.39	0.39	36.93%	38.31%	34.96%	63.07%	61.69%	65.04%
	50 µg/mL	0.43	0.43	0.43	40.47%	42.17%	38.12%	59.53%	57.83%	61.88%
	25 µg/mL	0.49	0.45	0.46	45.80%	43.80%	41.16%	54.20%	56.20%	58.84%
	12.5 µg/mL	0.48	0.53	0.52	45.83%	51.75%	46.33%	54.17%	48.25%	53.67%

From the observations, the concentration of bacteriocin at 15.63 µg/mL is cytotoxic to 53.67% of the breast cancer cells which is lower than the standard acceptable concentration of Doxorubicin HCl, the positive control, that is 20 µg/mL (Refer to Figure 1). The microscopical images of the untreated breast cancer cells also showed the decrease in number cancer cells when treated with bacteriocin at concentration 15.63 µg/mL (Refer to Figure 2). Based on data gathered and computed, the lower the concentration of bacteriocin, the more cytotoxic activity it has.

FIGURE 1. Comparison of the ICs0 of Doxorubicin HCl and Bacteriocin

FIGURE 2. Effect of bacteriocin with 15.63 µg/mLconcentration and Doxorubicin HCl (positive control) with 20 µg/mL concentration to breast cancer cells

CONCLUSION AND RECOMMENDATION

CONCLUSION:

In the result of the experimentation, the bacteriocin extracted from *Lactobacillus acidophilus* through ammonium sulphate and t-butanol precipitation gave a positive antimicrobial susceptibility with the use of agar well diffusion method. The highest antimicrobial susceptibility 7B with an average of 9.5mm against he 4 bacterial pathogens was used in MTT bioassay to measure its cytotoxic effect. Furthermore, the results of the MTT bioassay prove that the extracted bacteriocin is cytotoxic to 53% of the breast cancer cells at concentration 15.63 µg/mL. In addition to that, this concentration is lower than the standard acceptable concentration of the positive control (Doxorubicin HCl) at 20.00 µg/mL. Based on the data and computations obtained, the lower the concentration of bacteriocin against the positive control, the more cytotoxic activity it has against breast cancer cells.

RECOMMENDATION:

The following are recommended for future work:

1. A study on bacteriocin producing bacteria
2. Capability of bacteriocin in inhibiting the growth of other cancer cell lines through MTT bioassay.
3. Determine the cytotoxicity of the bacteriocin against fibroblasts.
4. Test the anti-microbial of bacteriocin d with other pathogens other than what this study had used
5. Research on the different uses of bacteriocin in the field of medicine and drug industry.
6. Perform SDS page to be to identify Bacteriocin from *Lactobacillus acidophilus* in order to increase the reliability of its effects.

REFERENCES

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Others

PO-29

IN-VITRO CYTOTOXIC ACTIVITY OF MYXOBACTERIAL EXTRACT ON BREAST CANCER CELLS AND HUMAN DERMAL FIBROBLAST

Leonard Bien S. Ejipto[1], Christiane E. Gavino[1], Alphonse Leandro F. Lomotan[1], Khristine Grace A. Salamat[1], Asst. Prof. Gregorio L. Martin I[1], Asst. Prof. Sheila Grace Alarilla-Martin[2]

[1]University of Santo Tomas, Faculty of Pharmacy, Department of Medical Technology
[2]Manila Central University, College of Medical Technology

ABSTRACT

Myxobacteria are considered rich producers of secondary metabolites, substances that are produced by most bacteria and utilized as components in antibiotics. Screening of products derived from these bacteria has revealed a significant amount of activity against infectious and non-infectious human diseases such as cancer.

In this study, the researchers extracted secondary metabolites from *Myxococcus xanthus* through the fermentation method and subsequently tested the resulting extract on breast cancer cells and human dermal fibroblast to determine its cytotoxicity.

Key words: Myxobacteria, Secondary Metabolites, Cancer

INTRODUCTION

Myxobacteria are soil-dwelling organisms known for its fruiting body formation (Cao, *et. al.* 2015) and gliding motility (Dawid, 2006). These bacteria are considered rich producers of secondary metabolites with over 100 unique structures and over 500 derivatives characterized (Meiser, *et. al*, 2006). The diversity and unique structural properties of their secondary metabolites is what make these microbes highly attractive for drug discovery (Diez, *et. al*, 2012). Screening of products derived from these bacteria has revealed a significant amount of activity against infections and non-infectious human diseases such as cancer. (Wang, *et. al.*, 2011)

Myxococcus xanthus was used in this study. It is a rod-shaped, unflagellated bacteria that forms a mucoid, dome-shaped mound as a fruiting body. It is the focus of most studies on the social behavior of Myxobacteria. (Shimkets, 1990)

Figure 1: Fruiting body of *Myxococcus* xanthus. (Image from ETZH.ch/Gregory J. Velicer)

OBJECTIVES

General objective: To determine the effects of *Myxococcus xanthus* extracts on breast cancer cells.

Specific Objectives:

- To determine the cytotoxicity of *Myxococcus xanthus* extracts on breast cancer cells and on human dermal fibroblast.
- To compare the difference in the cytotoxicity pattern of *Myxococcus xanthus* extracts at different concentrations.

METHODS

Phase 1: Extracting of Crude Extracts

- Subculture of *M. xanthus* from pure culture was performed on Pond Water Agar using Cut-Edge Method.
- Subculture was placed in CYE broth with 1% Amberlite resin for fermentation run and agitated constantly for seven days.
- Resins were sieved out and metabolites were eluted with five changes of 50 mL of methanol.
- Extracts were concentrated using a rotary evaporator and lyophilized at -50°C.

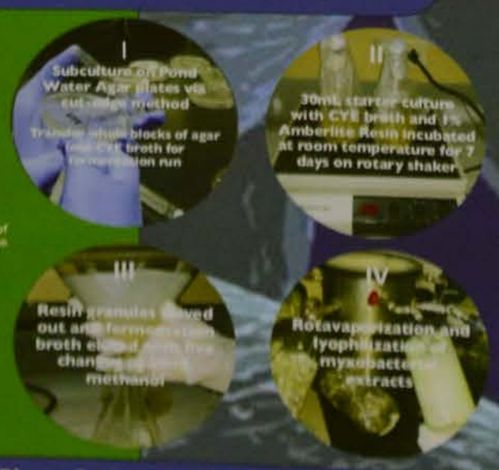


Figure 2: Procedures of Phase 1 of the Methodology

Phase 2: Cytotoxicity Testing

- MCF-7 breast cancer cells and human dermal fibroblasts are seeded into plates and incubated in a 37 °C incubator with 5% CO2 for twenty-four hours.
- Cells were treated in increasing concentrations of *M. xanthus* extract. Increasing concentrations of Doxorubicin-HCl were used as positive control. 100 µL of each concentration were added into each well and incubated for twenty-four hours.
- 20 µL of 3-(4,5-dimethylethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) was added to each well and incubated for 4 hours.
- 200 µL of DMSO was added and absorbance was read at 570 nm with microtiter plate reader.

RESULTS AND DISCUSSION

The results gathered from MTT assay performed by the UST Mammalian Tissue Culture Laboratory showed the raw data of the absorbance readings at 570 nm of human dermal fibroblasts and breast cancer cells treated with *M. xanthus* extracts at decreasing concentrations, done in three trials each. The absorbances were then used to compute the percent cytotoxicity of the extract.

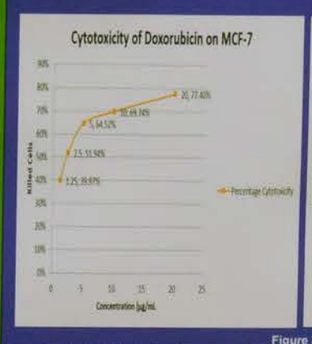
Table 1:
Average absorbance readings of MCF-7 cells treated with *M. xanthus* extract at increasing concentrations

Sample	Conc. (µg/mL)	Average Absorbance
Untreated cells	-	1.233
Extract Concentration (µg/mL)	250	0.073
	125	1.163
	62.5	1.026
	31.25	1.147
	15.63	0.708

Table 2:
Average absorbance readings of Human Dermal Fibroblasts treated with *M. xanthus* extract at increasing concentrations.

Sample	Conc. (µg/mL)	Average Absorbance
Untreated cells	-	1.307
Extract Concentration (µg/mL)	250	0.847
	125	0.861
	62.5	1.248
	31.25	1.119
	15.63	1.215

The cancer cells treated with *M. xanthus* extracts showed erratic progression with an increase and decrease in percent cytotoxicity in increasing concentrations whereas the normal cells treated with *M. xanthus* extracted showed a more consistent progression in increasing concentrations.



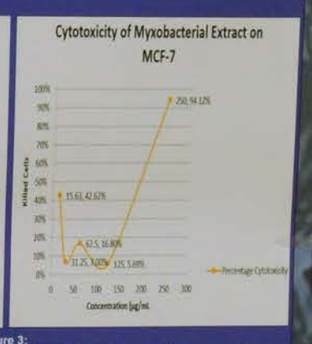
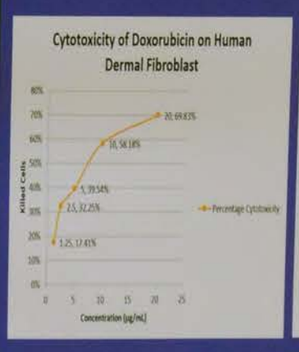


Figure 3:
Graph of Cytotoxicity of Myxobacterial Extract on MCF-7 Breast Cancer Cells Compared to Standard Doxorubicin



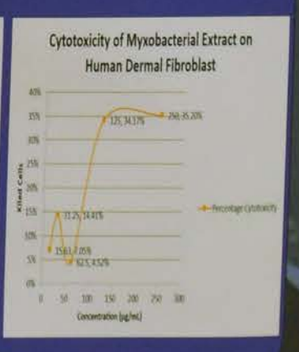


Figure 4:
Graph of Cytotoxicity of Myxobacterial Extract on Human Dermal Fibroblast Compared to Standard Doxorubicin

CONCLUSION

The MTT assay was used to determine the cytotoxicity of the *M. xanthus* extract towards the cells used in the study. Results showed that *M. xanthus* secondary metabolites are found to be more cytotoxic (94.12%) against cancer cells than normal cells (35.20%). The erratic progression in the percentage cytotoxicity of myxobacteria to MCF-7 cells may be due to the presence of unstable double or triple bonds, acylamide bonds or other groups.

RECOMMENDATIONS

- Perform phytochemical screening on Myxobacterial extracts to identify specific metabolites.
- Perform High Performance Liquid Chromatography (HPLC) analysis on the extracts to identify interfering biochemical compounds

REFERENCES

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Others

PO-30

*Faculty of Healt

Introduction

Infertility, the inability of a person to c
context one third of the reasons are r
unknown. World Health Organization
a clinical pregnancy after 12 months
reproductive technology is needed. T
injection) using the couples own egg
In such cases egg- or sperm donatio

Laws and regulation concerning game
politics show the complexity of the sub

	Denmark	Fir
Egg donation	Y	
Sperm donation	Y	

	Denmark
Relevance of family status	Married or cohabiting cou lesbian couple single women
Regulated by law	Yes
Limits to the no. of offspring using the same donor	Max.12 pregnancies fro same donor
Donor anonymity	Optional
Surrogacy	Not allowed

Table 2. Regulation of gamete donation in Nordic countrie

Discussion

As shown in table 1 all Nordic countries al
argument for allowing egg donation is that
a much more complicated procedure for th
they report donation as a positive experien
giving birth to a child has always, throughо
Regulations of assisted reproductive techn
women. Many single women go abroad to g
children will loose the right to know the don
The Norwegian Biotechnology Advisory Boa
an ongoing discussion. The Biotechnology A

References
(1) www.who/int/reproductive health 16.08.10 ; (2) Nordforsk Legislatio
Advisory Board Evaluation of Biotechnology Act 2014–15

...KIC ACTIVITY OF
...CT ON BREAST CANCER
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...Leandro F. Lomotan[1], Khristine Grace A. Salamat[1],
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...t of Medical Technology

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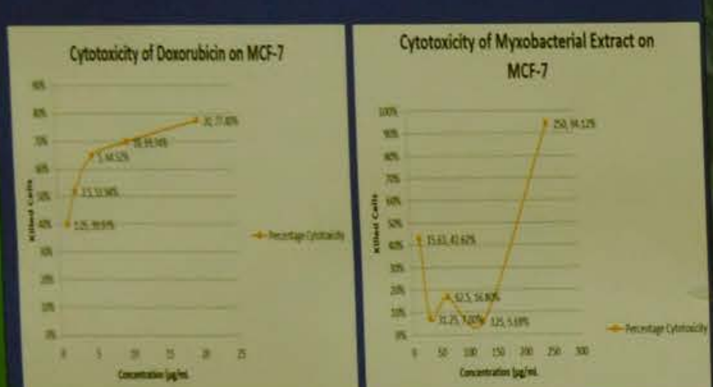

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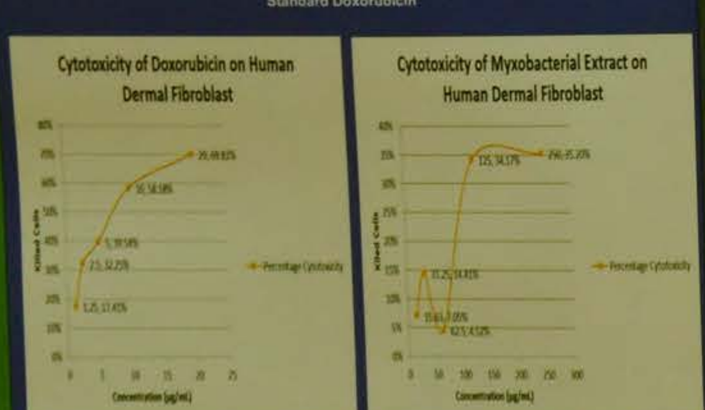
Graph of Cytotoxicity of Myxobacterial Extract on MCF-7 Breast Cancer Cells Compared to Standard Doxorubicin



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REFERENCES

Cao, P., Dey, A., Vasallo, C., & Wall, D. (2015, August). How Myxobacteria Cooperate. *Journal of Molecular Biology*.

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Others

PO-30

Biotechnology in human medicine
Egg- and sperm donation YES or NO

OSLO AND AKERSHUS UNIVERSITY COLLEGE OF APPLIED SCIENCES

Hilde Herning*

*Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, Oslo, Norway

Introduction

Infertility, the inability of a person to conceive is regarded as the most important reason for involuntary childlessness. In a broad context one third of the reasons are related to female factors, one third to male factors and one third to combined factors or unknown. World Health Organization define infertility as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse."(1) To achieve pregnancy assisted reproductive technology is needed. The most common treatments are IVF (in vitro fertilization) and ICSI (intracytoplasmatic sperm injection) using the couples own egg and sperm. However, some individuals will not be able to provide their own healthy egg or sperm. In such cases egg- or sperm donation might be the crucial factor to be able to conceive.

Laws and regulation concerning gamete donation are different within the Nordic societies. Discussions, both in medicine, ethics and politics show the complexity of the subject. (2)

	Denmark	Finland	Iceland	Norway	Sweden
Egg donation	Y	Y	Y	**N**	Y
Sperm donation	Y	Y	Y	Y	Y

Table 1. Gamete donation in Nordic countries.

	Denmark	Finland	Iceland	Norway	Sweden
Relevance of family status	Married or cohabiting couples, lesbian couples, single women	Heterosexual married or cohabiting couples, single women	Married or cohabiting couples, lesbian couples, single women	Married or cohabiting couples, lesbian couples.	Married or cohabiting couples, lesbian couples
Regulated by law	Yes	Yes	Yes	Yes	Yes
Limits to the no. of offspring using the same donor	Max.12 pregnancies from same donor	No legal limits	No	Max. 8 children with sperm from one donor	No legal limits
Donor anonymity	Optional	No	Optional	No	No
Surrogacy	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed

Table 2. Regulation of gamete donation in Nordic countries.

Discussion

As shown in table 1 all Nordic countries allow sperm donation. Egg donation is allowed in all countries except Norway. The main argument for allowing egg donation is that there should be equal opportunities for men and women. Some argue that egg donation is a much more complicated procedure for the donor than sperm donation. Egg donors are not much studied, but in some small studies they report donation as a positive experience.(3) Some mean that egg donation cross an important ethical boundary. The woman giving birth to a child has always, throughout history, been the child's biological mother.
Regulations of assisted reproductive technology differ between the countries. Norway and Sweden do no allow treatment to single women. Many single women go abroad to get the treatment.(4) Some of them go to countries which allow anonymous donors. Their children will loose the right to know the donor. No countries allow surrogacy.
The Norwegian Biotechnology Advisory Board recommend to allow egg donation. Today the political majority is against it, but there is an ongoing discussion. The Biotechnology Act is to be revised. It has been multiple delays, a sign of the complexity of the topic.

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(1) www.who/int/reproductive health 16.08.10 ; (2) Nordforsk Legislation on biotechnology in the Nordic countries – an overview 2015; (3) Lampic, C., Skoog Svanberg, A., & Sydsjo, G. (2014) (4) Norwegian Biotechnology Advisory Board Evaluation of Biotechnology Act 2014–15

Others

PO-31

Summary of...

- We examined t... ambulance tra...
- The number of... cerebrovascula... However, we o... gastrointestina...
- Increased sunl... emergency tra...

1 Background

1. In Japan, most epidem... previously reported on ... relationship. However, ... **association of meteor... ambulance transports**
2. It has been limited to e... **relationship between ... emergency transports**

Our purpose was to asse... meteorological factors w... transports for several dis... generalized additive mod...

2 Methods

Study site: **Nagoya city (3...**
- Population: 2.2 million (O...

Meteorological factors dat... the Japan Meteorological Ag...

Ambulance transports dat... the Nagoya Public Ambulanc...

Statistical analysis:
Generalized additive mod...
Useful to fit the non-linear r... spline function (R package "...

We constructed this model to ... emergency transports relatio... the potential confounders.

$\log(E[\text{daily emergency transports}_i]) = f_1(\text{time}_i) + \ldots + s_3(\text{pressu}\ldots + s_6(\text{precipi}\ldots$

All statistical analysis was perform...

3 Results

Table.1 Summary statistics of mete...

		mean	min	1st quartile
ambient temperature	℃	16.2	-0.3	8.3
relative humidity	%	65.1	28.0	57.0
mean land pressure	hPa	1007.8	982.5	1003.2
sunlight duration	hrs	5.6	0.0	1.7
wind speed	m	2.7	1.0	2.1
precipitation	mm	4.0	0.0	0.0

The 32nd World Congr...
Conflict of In...

Others
PO-31

Associations of meteorological factors with ambulance transports between 2002 and 2007 in Nagoya, Japan

Ryosuke FUJII[1)], Chiharu SUTO[2)], Takaaki KONDO[1)]
1) Department of Pathophysiological Laboratory Sciences, Nagoya University
2) Department of Bioscience and Biotechnology, Chubu University (Retired)

Summary of the present study

- We examined the relationship between meteorological factors and ambulance transports from 2002 to 2007 in Nagoya, JPN
- The number of ambulance transports for cardiovascular and cerebrovascular diseases was higher in lower ambient temperature. However, we observed an inverse relationship in respiratory and gastrointestinal diseases.
- Increased sunlight exposure seems to be related with the number of emergency transports for cardiovascular and cerebrovascular diseases.

1 Background

1. In Japan, most epidemiological evidences previously reported on weather-mortality relationship. However, **a few studies on the association of meteorological factors and ambulance transports**.
2. It has been limited to estimate **non-linear relationship between weather factor and emergency transports**.

Our purpose was to assess the association of meteorological factors with ambulance transports for several diseases using a generalized additive model.

2 Methods

Study site: **Nagoya city (35°11'N, 136°55'E)**
- Population: 2.2 million (Oct 2010)

Meteorological factors data was obtained from the Japan Meteorological Agency.

Ambulance transports data was provided by the Nagoya Public Ambulance Emergency Service.

Statistical analysis:
Generalized additive model (GAM)
Useful to fit the non-linear relationship by using spline function (R package "mgcv").

We constructed this model to estimate weather-emergency transports relationship after controlling the potential confounders.

$$log(E[daily\ emergency\ transports_i]) = f_1(time_i) + s_1(temperature_i) + s_2(humidity_i) + s_3(pressure_i) + s_4(sunlight_i) + s_5(wind_i) + s_6(precipitation_i) + \beta_1 dow_i + \beta_2 holiday_i$$

All statistical analysis was performed by R (ver. 3.2.4)

3 Results

Table.1 Summary statistics of meteorological data

		mean	min	1st quartile	median	3rd quartile	max
ambient temperature	℃	16.2	-0.3	8.3	16.7	23.6	32.7
relative humidity	%	65.1	28.0	57.0	64.0	73.0	97.0
mean land pressure	hPa	1007.8	982.5	1003.2	1007.7	1012.5	1026.5
sunlight duration	hrs	5.6	0.0	1.7	6.0	9.1	13.6
wind speed	m	2.7	1.0	2.1	3.0	3.6	8.5
precipitation	mm	4.0	0.0	0.0	0.0	1.5	136.0

3 Results (Cont.)

Table.2 Summary statistics of ambulance transports (cases per day)

	median	1st quartile	3rd quartile
cardiovascular disease	15	12	17
cerebrovascular disease	40	18	49
respiratory disease	28	22	33
gastrointestinal disease	16	13	19

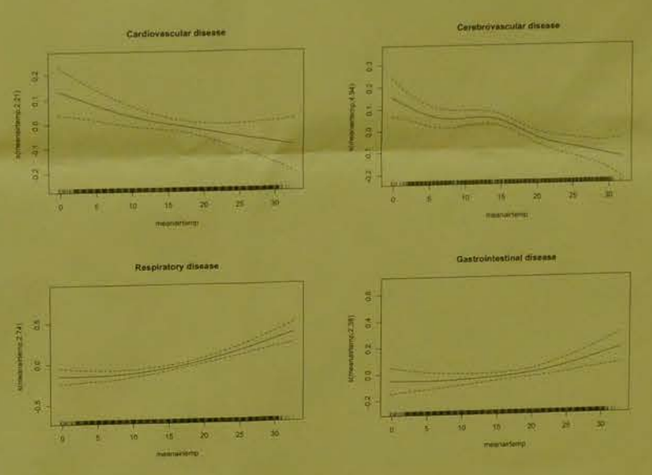

Figure.1
The relationship between temperature and ambulance transports for each disease. The solid lines show mean estimates, and dotted lines show 95%confidence intervals.

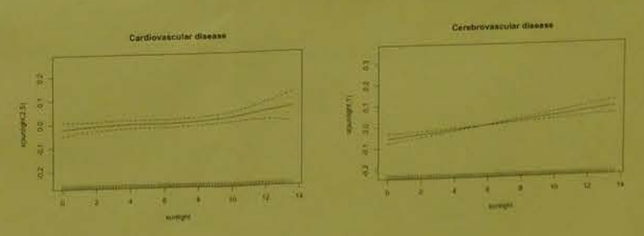

Figure.2
The relationship between sunlight duration and ambulance transports for each disease. The solid lines show mean estimates, and dotted lines show 95%confidence intervals.

4 Discussion

Conceivable mechanisms on temperature-disease relationship:

Previous studies reported that arterial pressure, blood viscosity, plasma cholesterol and fibrinogen increased in lower ambient temperature. Thus, we observed this result in cardiovascular and cerebrovascular disease.

Limitations and Future research:

1. Effect of recurrent cases
2. Misclassification in each case

We plan to investigate the effect of meteorological exposure at the previous *N* day (lag effect) on ambulance transports.

The 32nd World Congress of Biomedical Laboratory Science (Kobe, JPN): 31st, Aug – 4th, Sep 2016
Conflict of Interest (COI) of the Principal Presenter : No potential COI to disclose

Others
PO-32

Purpose

Most of the patients
hemodialysis. For th
impossible to locate t
and 3 to 5 tries for a
processes in case of n
The patients need to
reveal the vein for ex
if they wish to join. I
compress bag for hot

Introduction

These files have retain
Technologist (MT) do
corner of the health in
to do blood test, and th
the doctor-patient relat

Methods

We labeled a number
file. The file included
name or ID wasn't inc
angle to withdraw the b
1. Inclusion criteria :
Some patients think
2. Exclusion criteria :
20 years old.
3. Withdraw criteria ar
the program anytime
4. Sample size and stu
the IRB agreement t

Results

Fig01.
Long play pain killer needle,blood vessel become too fine, right hand measured arterial blood pumping.

Fig04.
Right wrist near the front left side of the patient's body has a touch of the blood vessels do not see, then let fist holding and upward.

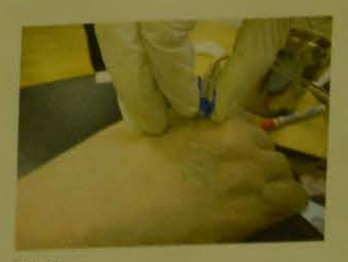

Fig07.
The back of the hand, heat obvious.

Conclusion

There was an experience fr
phlebotomists didn't care a
meat on somebody's choppi
blood with effectiveness, bu
are more exhausting, if we
withdrawing blood, and any
mood should be turned to po
We retained 30 patients draw
and nineteen patients doing
blood vessels is very fine. W
can provide this file to all
afraid of withdraw blood a
gradually improved and refe
scientists.

OSLO AND AKERSHUS UNIVERSITY COLLEGE OF APPLIED SCIENCES

s, Oslo, Norway

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hieve pregnancy assisted
nd ICSI (intracytoplasmatic sperm
rovide their own healthy egg or sperm.

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Table 1. Gamete donation in Nordic countries.

Norway	Sweden
rried or cohabiting uples, lesbian uples.	Married or cohabiting couples, lesbian couples
s	Yes
ax. 8 children with perm from one donor	No legal limits
lo	No
Not allowed	Not allowed

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not much studied, but in some small studies
important ethical boundary. The woman

d Sweden do no allow treatment to single
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Takaaki KONDO[1)]
y Sciences, Nagoya University
y, Chubu University (Retired)

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Nagoya, JPN

rdiovascular and
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lated with the number of
d cerebrovascular diseases.

Results (Cont.)

Summary statistics of ambulance transports (cases
y)

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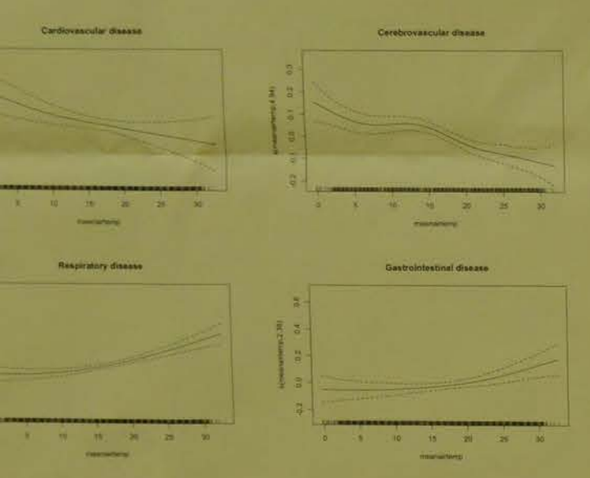
ntestinal disease	16	13	19



e.1
relationship between temperature and ambulance
sports for each disease. The solid lines show mean
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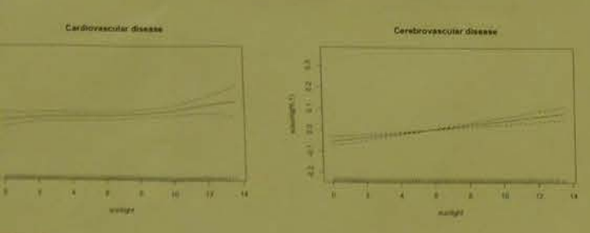

ure.2
relationship between sunlight duration and ambulance
nsports for each disease. The solid lines show mean
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Discussion

onceivable mechanisms on temperature-sease relationship:

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1. Effect of recurrent cases
2. Misclassification in each case

We plan to investigate the effect of meteorological exposure at the previous *N* day (lag effect) on ambulance ransports.

nce (Kobe, JPN): 31st, Aug – 4th, Sep 2016
nter : No potential COI to disclose

Others
PO-32

Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation

Establishing pictures of withdrawed sites in difficult withdrawed patients

Chuan Chi Chan[1] | Jui Chien Chang[2] | Tsai Lian Yang[3] | Hsiang Lin Wan[4]

Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medicine Foundation, Department of Laboratory Medicine, New Taipei City Taiwan

Purpose

Most of the patients admitted to our hospital suffer from chronic diseases, chemotherapy and hemodialysis. For those who need to be exsanguinated, the cold weather makes it almost impossible to locate the vein. Medical laboratory scientists usually take 5 to 30 minutes to locate and 3 to 5 tries for a successful draw of blood. Videos and photos are used to document the processes in case of making the same mistakes.
The patients need to return periodically for checkups. We use hot compresses on cold limbs to reveal the vein for exsanguinations. Meanwhile, we elaborate our research project and ask them if they wish to join. If agreed, the patient signs an agreement and is given a complimentary hot compress bag for hot compression in advanced of exsanguinations.

Introduction

These files have retained and retrieved when those patients withdraw blood regularly, Medical Technologist (MT) do not need to spend a lot of time looking for blood vessel, just look at a corner of the health insurance card number affixed stickers and find the file, As recommended to do blood test, and then the patient can no longer fear to do withdraw blood, as well as keep the doctor-patient relationship more harmonious.

Methods

We labeled a number on a patient's health insurance card. With the number, we can check the file. The file included hand or feet image. Only left or right hand or foot was written, patient's name or ID wasn't included. Also there was an explanation of where, what depth, and which angle to withdraw the blood.

1. Inclusion criteria：When the vein is not found easily, we will ask the willing of the patient. Some patients think their veins are narrow, and they want to have files.
2. Exclusion criteria：The patient doesn't want to attend to program. And the patient isn't over 20 years old.
3. Withdraw criteria and rescue medication：The patient can call 02-66289779＃3230 to abort the program anytime.
4. Sample size and study duration：We recruited 30 participants. Study duration started from the IRB agreement to 2015.12.31.(Fig10-IRB Approval Letter)

Results

Fig01.
Long play pain killer needle,blood vessels become too fine, right hand measured arterial blood pumping.

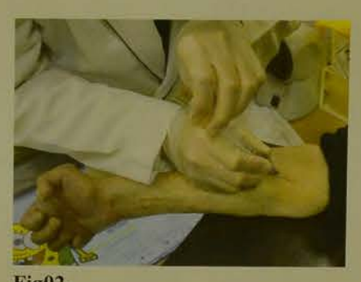


Fig02.
Patients with rheumatoid arthritis, poor heat effect, right arm pumping arterial blood.

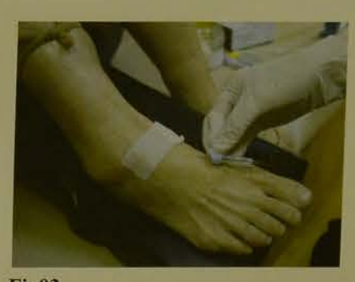


Fig03.
Right instep, chemotherapy treatment, ban both hands are less likely to slip this vessel.

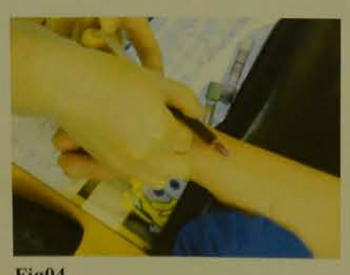


Fig04.
Right wrist near the front left side of the patient's body has a touch of the blood vessels do not see, then let fist holding and upward.

Fig05.
There is a blood vessel at the right index finger, first heat.

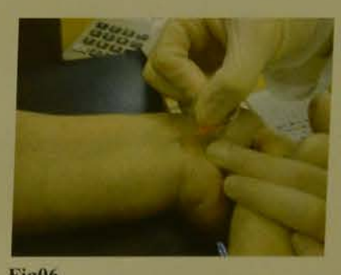


Fig06.
Obviously left wrist slightly after the middle of the heat.

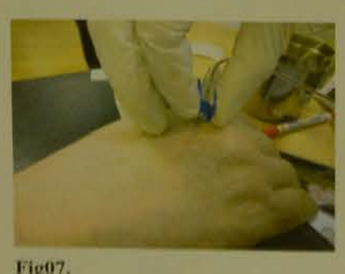


Fig07.
The back of the hand, heat obvious.

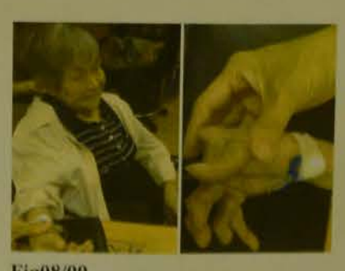


Fig08/09.
Rheumatoid arthritis, the back of the hand too thin,the vessel can be pumped from the wrist, fine blood vessels can't be forced to shoot.

Fig10.
IRB Approval Letter

Conclusion

There was an experience from a medical center in north Taiwan: one patient has complained the phlebotomists didn't care about patient's frame of mind. Even some patient's feel they look like a meat on somebody's chopping block when they need to do blood test. The phlebotomists withdrew blood with effectiveness, but some patients need us to care about their fear emotion. People with ill are more exhausting, if we can make them not afraid of taking medication, receiving an injection, withdrawing blood, and any examination. Although the disease hasn't been improved, the patient's mood should be turned to positive.
We retained 30 patients drawing. There are three patients doing withdraw blood via arterial blood, and nineteen patients doing withdraw blood via 25 Gauage winged infusion set, with the patient's blood vessels is very fine. When we conduct this program, some patients family suggested that we can provide this file to all of the nurse in this hospital, and then their families will be no longer afraid of withdraw blood and injection. Therefore, we will extend this plan, make the file be gradually improved and referred by all of the hospital nursing colleagues and medical laboratory scientists.

Others
PO-3

Others

PO-34

Difficult cases in venous blood collection: current status and approach

Yoshiko Murata, Yasuyuki Okayama, Koji Yamamoto, Hiroshi Nakano
Department of Clinical Laboratory, Saiseikai Matsusaka General Hospital, Mie, Japan

Introduction

In our laboratory, we perform phlebotomy of out patients according to the guideline (1). However, we sometimes experience difficulties in procedure of venous blood collection. Thus we surveyed and analyzed these cases related to venous blood collection and some approaches.

Materials and Methods

Saiseikai Matsusaka General Hospital
- 430 beds
- 22 clinics

Staffs
- Medical technologists: 5
- Nurses: 4
- Years of experience: 1-17 (average 8)

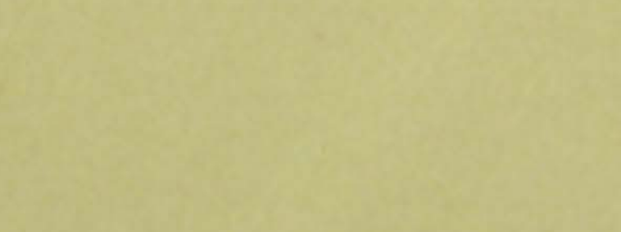
Equipment
- pillow for blood collection
- disposable gloves
- needles (21G, 23G)
- butterfly needles (23G)
- vacuum blood collection tube
- tourniquet
- antiseptic solution
- adhesive plaster

Survey was conducted using questionnaire to staffs with every difficult case in venous blood collection. The questionnaire consisted of 4 questions (definition of difficult cases in venous blood collection, reasons, blood collection device, and approaches). Multiple answers were allowed for each question.

Definition of difficult cases in venous blood collection
- two times of collection failure
- impalpable vein
- invisible vein
- others (lower extremities)

Reasons
- inaccurate recognition of vein course
- vein with a tendency to move or "roll"
- tortuous vein
- fragile vein
- hard vein
- no flow during collection
- pressure from patient

Blood collecting device



needle (22G) + syringe | needle (21G) + vacuum blood collection tube | butterfly needle (23G) + vacuum blood collection tube

Approaches
- minor change in venipuncture site
- warming
- supine position
- major change in venipuncture site (lower extremities, central venous catheter, arterial puncture)
- change in phlebotomists

Results

Period: from May 2016 to June 2016
Out patients: 4637 (average 220/day)
Difficult cases: 24 cases (0.5%, 24/4637)
age: 69.3±14.8
gender: 11 male, 13 female

All difficult cases were successfully completed.

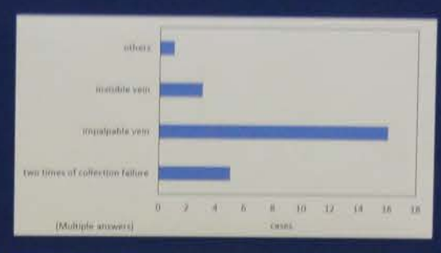


Figure 1 (Definition)
The most common difficulty among staffs was impalpable vein (64%, 16/25).

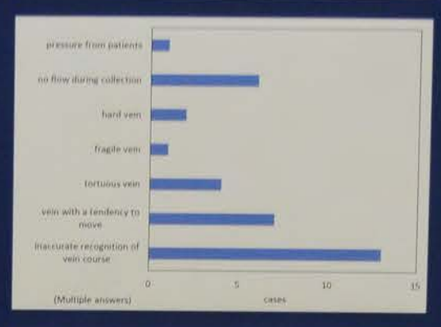


Figure 2 (Reasons)
The most common reason of difficult cases was inaccurate recognition of vein course (38.2%, 13/34). The vein with a tendency to move (20.6%, 7/34) and no flow during collection (17.6%, 6/34) were also the reasons.

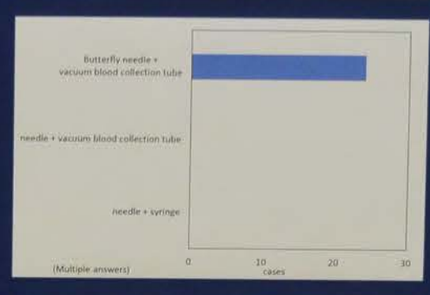


Figure 3 (Device)
Butterfly needle with vacuum blood collection tube was used for all difficult cases in venous blood collection.

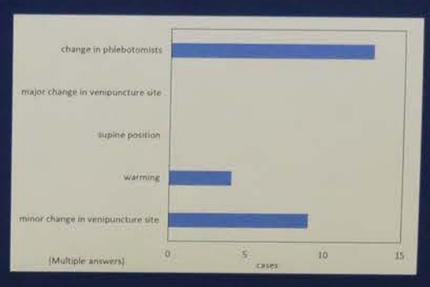


Figure 4 (Approaches)
The fifty percentage (13/26) of approaches was change in phlebotomist. Minor change in venipuncture site (34.6%, 9/26) and warming (15.4%, 4/26) were used for remaining cases.

Discussion

The most common difficulty among staffs was impalpable vein (64%). The reason of difficulty in venous blood collection was mainly classified into two factors. One was vein's factor, such as tendency to move, tortuous, fragile, hard, and no flow. The other was phlebotomist's factor, such as inaccurate recognition of vein course and pressure from patients. Vein's factor was 58.8% (20/34) and phlebotomist's factor was 41.2% (14/34). Both factors were found to be important for venous blood collection. Increase in skills may decrease the influence of phlebotomist's factor on venous blood collection. As a blood collecting device, a butterfly needle was selected. The device was thought to allow greater flexibility when performing blood collection on the difficult veins. The most common approach for difficult cases was change in phlebotomist. Well-trained phlebotomists have enough skills for difficult cases. Minor change in venipuncture site was also useful as an approach.

Conclusions

In this study, the difficult cases resulted from both vein and phlebotomist's factor. Difficult cases in venous blood collection were predominantly performed by change in phlebotomist.

References

1. S Watanabe. Standard phlebotomy guideline. JCCLS; 2011