Sino-Austrian Biomarker Research Center

o.Univ.-Prof. Mag. Dr. Günther Bonn

北京大学医学部
Peking University
Health Science Center

ACRC

Opening of the
Sino-Austrian Biomarker Research Center
at the 25th May 2006

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Peking University

Health Science Center

University of Innsbruck

Institute of Analytical Chemistry and Radiochemistry
Horvath Lab of Bioseparation

Sino - Austrian Biomarker Research Center at Peking University Health Science Center

TEACHING COURSES

- **Fundamentals** - separation sciences e.g. electrophoresis, HPLC, capillary electrophoresis
- mass spectrometry, LC-MS, MALDI
- biomarker discovery
- including practical exercises

Lecturers from Austria, PUHSC and guests; **Duration** per year: 6 – 14 days

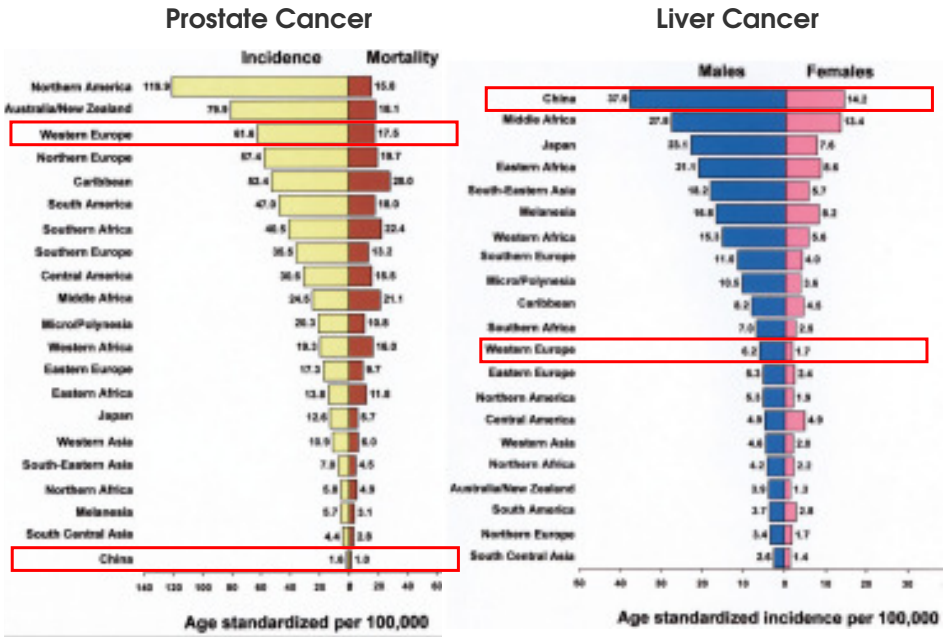
SCIENTIFIC PROJECTS

- **Development of new biomarker methods** as well as new materials for separation and MELDI
- **Development of disease related biomarker discovery methods including bioinformatics**
  e.g. liver cancer and prostate cancer
- **Application studies**
- **Natural Product Proteomics** (Phyto-Proteomics)

FELLOWSHIP PROGRAMS - Exchange on different levels

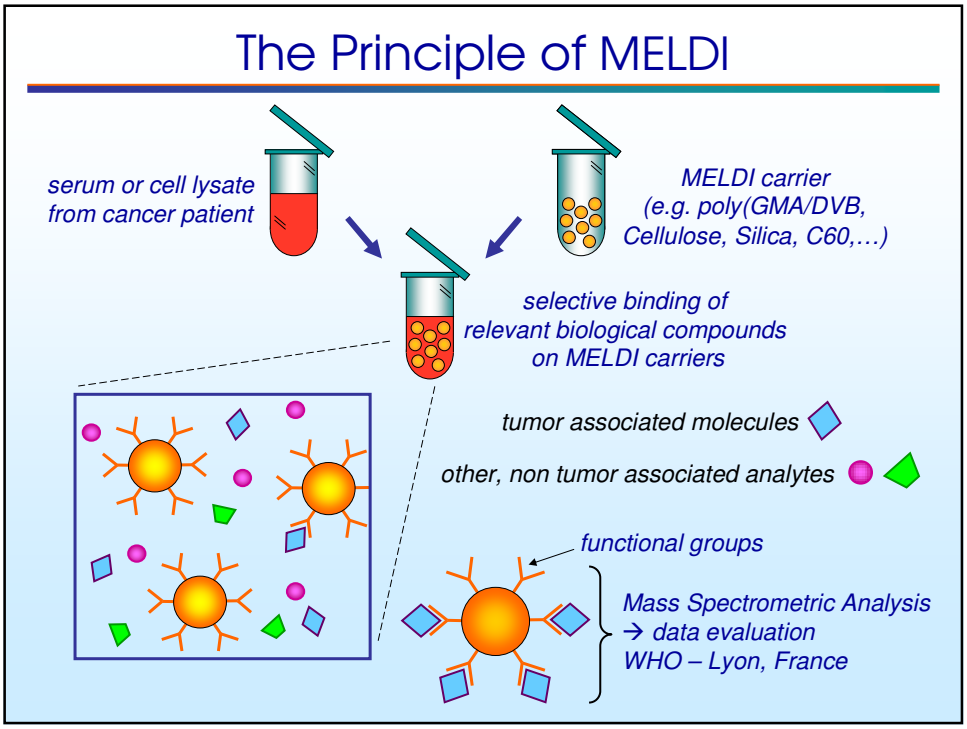
Academics, Students and Non-academic positions – technicians
Participation at the International Proteomics Conference, Seefeld Austria
Duration: 2 weeks, 3 months, up to 3 years (PH.D.) fellowships

EURASIA-PACIFIC UNINET

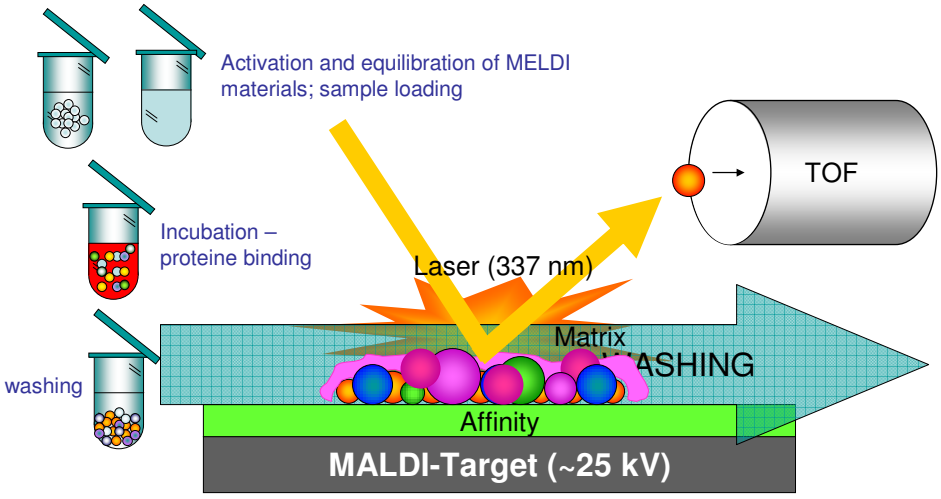


Age-standardized Incidence and Mortality Rates. Data shown per 100,000.

D. Max Parkin, Freddie Bray, J. Ferlay and Paola Pisani CA Cancer J Clin 2005;55;74-108

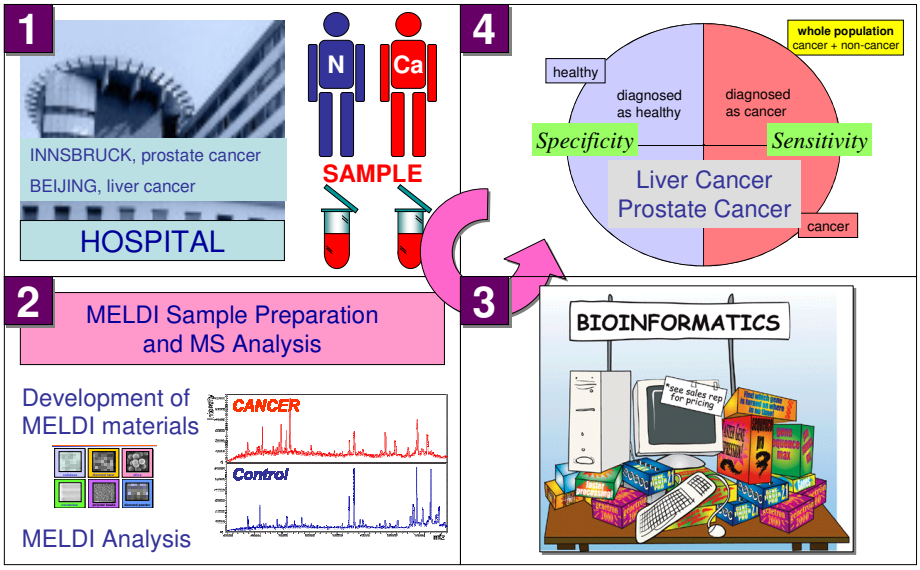


MELDI Sample Preparation



Feuerstein, Isabel; Najam-ul-Haq, Muhammad; Rainer, Matthias; Trojer, Lukas; Bakry, Rania; Aprilita, Nurul Hidayat; Stecher, Guenther; Huck, Christian W.; Bonn, Guenther K.; Klocker, Helmut; Bartsch, Georg; Guttman, Andras. JASMS (2006), 17(9), 1203-1208.

The Principle of MELDI



Synthesis of GMA/DVB Polymers for MELDI-MS

RAPID COMMUNICATIONS IN MASS SPECTROMETRY
Rapid Commun. Mass Spectrom. 2006; **20**: 2954–2960
Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/rcm.2673

RCM

Ultra-fast mass fingerprinting by high-affinity capture of peptides and proteins on derivatized poly(glycidyl methacrylate/divinylbenzene) for the analysis of serum and cell lysates

Matthias Rainer[1], Najam-ul-Haq Muhammad[1], Christian W. Huck[1], Isabel Feuerstein[1], Rania Bakry[1], Lukas A. Huber[2], Douglas T. Gjerde[3], Xiajuan Zou[4], Honggang Qian[4], Xiaojuan Du[4,5], Fang Wei-Gang[4], Yang Ke[4,5] and Günther K. Bonn[1,5]*

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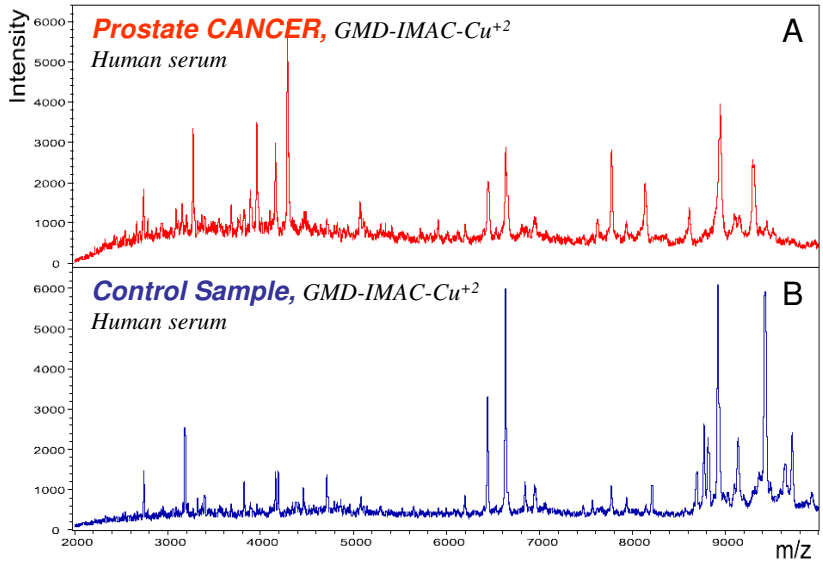
Received 12 April 2006; Revised 4 July 2006; Accepted 18 July 2006

The development of support materials in mass fingerprinting is an important task required for diagnostic markers in conjunction with matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS). The material-based approach, which we introduced as material-enhanced laser desorption/ionization (MELDI), focuses not only on different functionalities, but also emphasizes the morphology, i.e. porosity or particle size of the carrier material. As a result, it provides a quick and sensitive platform for effective binding of peptides and proteins out of different biofluids, e.g. serum, spinal fluid, urine or cell lysates, and to subsequently analyze them with MALDI-TOF MS. This approach includes a built-in desalting step for serum protein profiling and is sensitive enough to detect proteins and peptides down to 100 fmol/μL. Here we co-polymerized glycidyl methacrylate (GMA) with divinylbenzene (DVB) using thermal polymerization to yield a

Application of GMA/DVB to screen Prostate Cancer Serum Samples



Biomarker Study on Prostate Cancer

Genetic Algorithm GA
Model 1

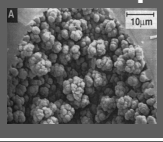
BRUKER ClinProt 2.2

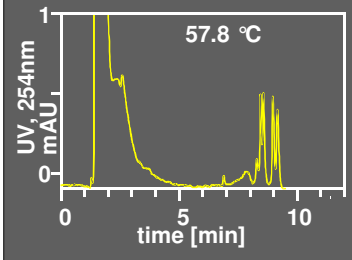
Class	Name	Correct Classified Part of Valid Spectra	1	2	0
1	**Control**	sensitivity **97.1 %**	34	1	0
2	**Prostate Cancer**	specificity **98.1 %**	1	51	0

Mutation Detection by Denaturing HPLC using Packed Columns and Monolithic Capillaries

PS-DVB C18 stationary phase
HPLC-Equipment
→ (worldwide ca. 3000 pieces sold)

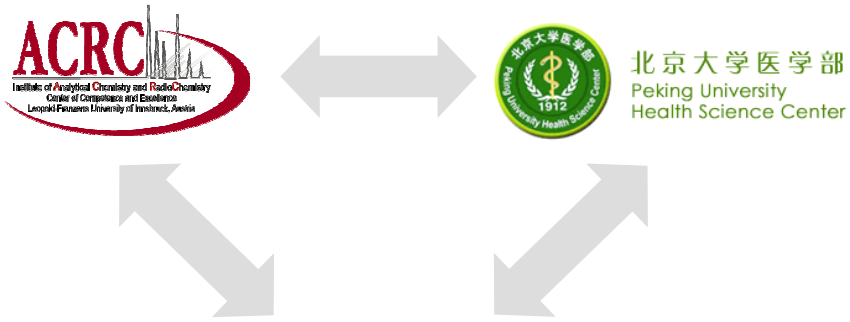
Monolithic Capillary





column: 50 x 0.2 mm I.D.
flow rate: 3.0 µl/min
injection vol.: 500 nl

Collaborations



International Agency for Research on Cancer
Centre International de Recherche sur le Cancer

WHO – Lyon, France