

Etiologies infectieuses et toxiques du cancer

Que fait-on à Lausanne?

Centre du Cancer de Lausanne

Cancer Center Lausanne

CCL

A collaborative effort of

– UNIL: Faculté de Biologie et de Médecine



– CHUVaudois



– Centre Pluridisciplinaire d'Oncologie



– Institut Ludwig



– ISREC

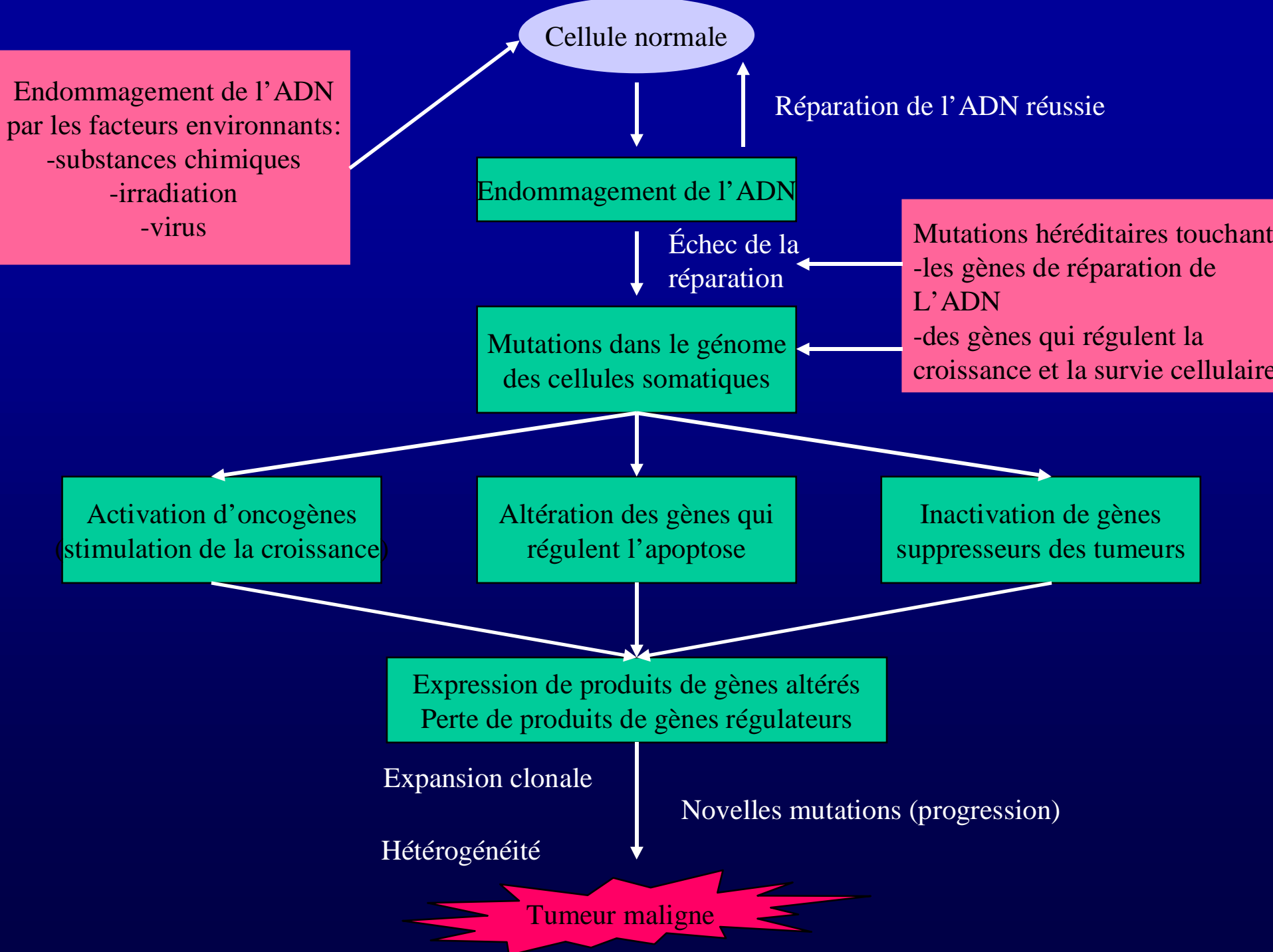


– NCCR Molecular Oncology



– EPFL





Chemical/physical oncogenesis

- Smoking
- Lifestyle/nutrition
- Occupational hazards
- Radiation protection

Microbial oncogenesis

- Oncogenic DNA viruses
 - HPV
 - EBV
 - HBV/HCV
 - HHV8/KSHV
- Oncogenic RNA viruses
 - HTLV-1
 - Other retroviruses
- Bacteria
 - *Helicobacter Pylori*

Research themes

- Oncogenesis
 - Ionizing radiation
 - Free radicals
 - Microbial agents
- Monitoring
 - Working environment
 - Radiation protection
- Epidemiology
 - Life style
 - Nutritional habits
- Prevention
 - Screening
 - Early detection
 - Vaccination

Participating groups

- Service d'Hématologie
 - Service de Gastroentérologie
 - Département de Pharmacologie et de Toxicologie
 - Institut Romand du Santé au Travail
 - Institut Universitaire de Radiophysique Appliquée
 - Régistre Vaudois des Tumeurs
 - Services ORL, d'urologie
 - Ecole Polytechnique Fédérale de Lausanne
 - Département de Gyn.-Obst./ Microbiologie
 - Institut Universitaire de Pathologie
 - Centre Pluridisciplinaire d'Oncologie
- Michel Duchosal
Darius Moradpour
Pierre Michetti
Emmanuelle Felley-Bosco
Marcel-André Boillat
Jean-François Valley
Fabio Levi
Philippe Monnier,
Patrice Jichlinsky
Hubert van den Bergh
Denise Nardelli-Haefliger
Fred Bosman
Serge Leyvraz

EBV and lymphomagenesis

Service d'Hématologie: Michel Duchosal

Epstein-Barr virus-dependent lymphoproliferative disease: critical role of IL-6

Sandrine Mauray¹, Marie-Thérèse Fuzzati-Armentero¹, Philippe Trouillet¹, Marlies Rüegg¹, Grazia Nicoloso², Margreet Hart³, Lucien Aarden³, Marc Schapira¹ and Michel A. Duchosal¹

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² Foundation Blood Transfusion Center of the Swiss Red Cross, Lausanne, Switzerland

³ CLB Sanquin Blood Supply Foundation, Department of Autoimmune Diseases, Laboratory for Experimental and Clinical Immunology, AMC, University of Amsterdam, Amsterdam, The Netherlands

Human Peripheral Blood Leukocyte Engraftment into SCID Mice: Critical Role of CD4⁺ T Cells

Michel A. Duchosal,^{*,1} Sandrine Mauray,^{*} Marlies Rüegg,^{*} Philippe Trouillet,^{*} Véronique Vallet,^{*} Lucien Aarden,[†] Jean-Daniel Tissot,[‡] and Marc Schapira^{*}

^{*}Division of Hematology, Department of Medicine, Centre Hospitalier Universitaire Vaudois, CH-1011 Lausanne, Switzerland;

[†]CLB Sanquin Blood Supply Foundation, Department of Autoimmune Diseases, Laboratory for Experimental and Clinical Immunology, AMC, University of Amsterdam, 1066 CX Amsterdam, The Netherlands; and

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Hepatocarcinogenesis: the role of HBV and HCV

Service de Hépatogastroenterologie: Dariush Moradpour

Pathogenesis of hepatocellular carcinoma

Darius Moradpour and Hubert E. Blum

Hepatocellular carcinoma (HCC) is one of the most common malignant tumours worldwide. The major aetiologies and risk factors for the development of HCC are well defined and some of the multiple steps involved in hepatocarcinogenesis have been elucidated in recent years. However, no clear picture of how and in what

tumours. New technologies, including gene expression profiling and proteomic analyses, should allow us to further elucidate the molecular events underlying HCC development and identify novel diagnostic markers as well as therapeutic targets. *Eur J Gastroenterol Hepatol* 17:477–483 © 2005 Lippincott Williams & Wilkins

A primer on the molecular virology of hepatitis C

Moradpour D, Blum HE. A primer on the molecular virology of hepatitis C. *Liver International* 2004; 24: 519–525. © Blackwell Munksgaard 2004

**Darius Moradpour and
Hubert E. Blum**

Oncogenesis: free radicals

Département de Pharmacologie et de
Toxicologie: Emmanuelle Felley-Bosco

Src-mediated phosphorylation regulates subcellular distribution and activity of human inducible nitric oxide synthase

P Hausel, H Latado, F Courjault-Gautier and E Felley-Bosco

Department of Pharmacology and Toxicology, Lausanne, Switzerland

Transition mutation in codon 248 of the *p53* tumor suppressor gene induced by reactive oxygen species and a nitric oxide-releasing compound

Anne-Christine Souici, Jovan Mirkovitch¹,
Pierrette Hausel, Larry K. Keefer² and
Emanuela Felley-Bosco³

Institute of Pharmacology and Toxicology, Rue du Bugnon 27,
1005 Lausanne, Switzerland, ¹Swiss Institute for Experimental Cancer
Research, 1066 Epalinges, Switzerland and ²Chemistry Section, Laboratory
of Comparative Carcinogenesis, National Cancer Institute, Frederick Cancer
Research and Development Center, Frederick, MD 21702, USA

Occupational hazards: monitoring

Institut Romand du Santé au Travail

Sauvain JJ, Duc TV. Approaches to identifying and quantifying polycyclic aromatic hydrocarbons of molecular weight 302 in diesel particulates. J Sep Sci. 2004;27:78-88.

Sauvain JJ, Vu Duc T, Guillemin M. Exposure to carcinogenic polycyclic aromatic compounds and health risk assessment for diesel-exhaust exposed workers. Int Arch Occup Environ Health. 2003;76:443-55.

Radiation protection: monitoring

Institut Universitaire de Radiophysique Appliquée:
Jean-François Valley

RADIATION EXPOSURE BY RADIO-DIAGNOSTICS IN SWITZERLAND: A PILOT PATIENT-ORIENTED SURVEY

A. Aroua^{1,*}, J.-F. Valley¹ and J.-P. Vader²

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²University Institute of Social and Preventive Medicine, Bugnon 17, 1005 Lausanne, Switzerland

DIAGNOSTIC AND INTERVENTIONAL RADIOLOGY: A STRATEGY TO INTRODUCE REFERENCE DOSE LEVEL TAKING INTO ACCOUNT THE NATIONAL PRACTICE

Francis R. Verdun^{1,*}, A. Aroua¹, Ph. R. Trueb², P. Vock³ and Jean-François Valley¹

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^{90}Sr , ^{238}U , ^{234}U , ^{137}Cs , ^{40}K and $^{239/240}\text{Pu}$ in
Emmental type cheese produced in different
regions of Western Europe

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J.-F. Valley^a

^a Institute of Applied Radiophysics, University of Lausanne, Grand Pré 1, 1007 Lausanne, Switzerland

^b Federal Dairy Research Institute (FAM), Liebefeld, 3003 Bern, Switzerland

Département Universitaire de Médecine Sociale et Communautaire

Registre des Tumeurs Vaudois

The registry is active in

- registration and the monitoring of epidemiology of cancer, at the national and international level
- evaluation of cancer risk factors

The registry functions

- in the context of a national network
- with a strong emphasis on international collaborations

Epidemiology: lifestyle

Cancer Registry of Vaud: Fabio Levi

- Garavello W, Negri E, Talamini R, Levi F, Zambon P, Dal Maso L, Bosetti C, Franceschi S, La Vecchia C. Family history of cancer, its combination with smoking and drinking, and risk of squamous cell carcinoma of the esophagus. *Cancer Epidemiol Biomarkers Prev.* 2005;14:1390-3.
- Altieri A, Bosetti C, Gallus S, Franceschi S, Dal Maso L, Talamini R, Levi F, Negri E, Rodriguez T, La Vecchia C. Wine, beer and spirits and risk of oral and pharyngeal cancer: a case-control study from Italy and Switzerland. *Oral Oncol.* 2004;40:904-9.
- Rodriguez T, Altieri A, Chatenoud L, Gallus S, Bosetti C, Negri E, Franceschi S, Levi F, Talamini R, La Vecchia C. Risk factors for oral and pharyngeal cancer in young adults. *Oral Oncol.* 2004 ;40:207-13.
- Tavani A, Bertuzzi M, Talamini R, Gallus S, Parpinel M, Franceschi S, Levi F, La Vecchia C. Coffee and tea intake and risk of oral, pharyngeal and esophageal cancer. *Oral Oncol.* 2003 ;39:695-700.
- Mack WJ, Preston-Martin S, Dal Maso L, Galanti R, Xiang M, Franceschi S, Hallquist A, Jin F, Kolonel L, La Vecchia C, Levi F, Linos A, Lund E, McTiernan A, Mabuchi K, Negri E, Wingren G, Ron E. A pooled analysis of case-control studies of thyroid cancer: cigarette smoking and consumption of alcohol, coffee, and tea. *Cancer Causes Control.* 2003;14:773-85.
- Gallus S, Bosetti C, Franceschi S, Levi F, Negri E, La Vecchia C. Laryngeal cancer in women: tobacco, alcohol, nutritional, and hormonal factors. *Cancer Epidemiol Biomarkers Prev.* 2003;12:514-7.
- Levi F, Lucchini F, Negri E, La Vecchia C. The end of the tobacco-related lung cancer epidemic in Europe. *J Natl Cancer Inst.* 2003;95:631-2.
- La Vecchia C, Levi F. Lung cancer in Europe: the levelling of an epidemic. *Eur J Public Health.* 2003;13:1-2.

Epidemiology: dietary factors

Cancer Registry of Vaud: Fabio Levy

- Pelucchi C, Galeone C, Levi F, Negri E, Franceschi S, Talamini R, Bosetti C, Giacosa A, La Vecchia C. Dietary acrylamide and human cancer. *Int J Cancer*. 2006 ;118:467-71.
- Zeng ZL, Sun J, Guo L, Li S, Wu MW, Qiu F, Jiang WQ, Levi F, Xian LJ. Circadian rhythm in dihydropyrimidine dehydrogenase activity and reduced glutathione content in peripheral blood of nasopharyngeal carcinoma patients. *Chronobiol Int*. 2005;22:741-54.
- Tavani A, Franceschi S, Levi F, La Vecchia C. Fish, omega-3 polyunsaturated fat intake and cancer at selected sites. *World Rev Nutr Diet*. 2005;94:166-75.
- Galeone C, Pelucchi C, Talamini R, Levi F, Bosetti C, Negri E, Franceschi S, La Vecchia C. Role of fried foods and oral/pharyngeal and oesophageal cancers. *Br J Cancer*. 2005;92:2065-9.
- Levi F, Pasche C, Lucchini F, Bosetti C, La Vecchia C. Processed meat and the risk of selected digestive tract and laryngeal neoplasms in Switzerland. *Ann Oncol*. 2004;15:346-9.

Epidemiology: microbial oncogenesis

Cancer Registry of Vaud: Fabio Levi

- Clifford GM, Polesel J, Rickenbach M, Dal Maso L, Keiser O, Kofler A, Rapiti E, Levi F, Jundt G, Fisch T, Bordoni A, De Weck D, Franceschi S; Swiss HIV Cohort. Cancer risk in the Swiss HIV Cohort Study: associations with immunodeficiency, smoking, and highly active antiretroviral therapy. *J Natl Cancer Inst.* 2005;97:425-32.
- Levi F, Randimbison L, Te VC, Franceschi S, La Vecchia C. Kaposi's sarcoma in Vaud and Neuchatel, Switzerland, 1978-2002. *Eur J Cancer.* 2004;40:1630-3.

Detection of early lesions: prevention

Departments of ENT, Urology, Pathology, Federal Polytechnical School (EPFL) Philippe Monnier, Patrice Jichlinsky, Hubert van den Bergh

Localization of tetra(*m*-hydroxyphenyl)chlorin (Foscan) in human healthy tissues and squamous cell carcinomas of the upper aero-digestive tract, the esophagus and the bronchi: a fluorescence microscopy study

S. Andrejevic Blant^{a,b,*}, P. Grosjean^b, J.-P. Ballini^c, G. Wagnières^c, H. van den Bergh^c, Ch. Fontolliet^a, Ph. Monnier^b

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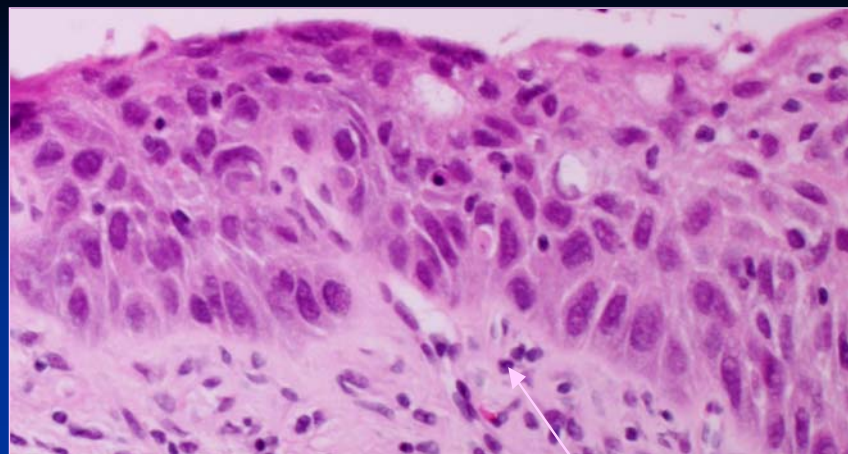
Patrice Jichlinski
Hans-Jurg Leisinger

Department of Urology, CHUV,
Lausanne, Switzerland

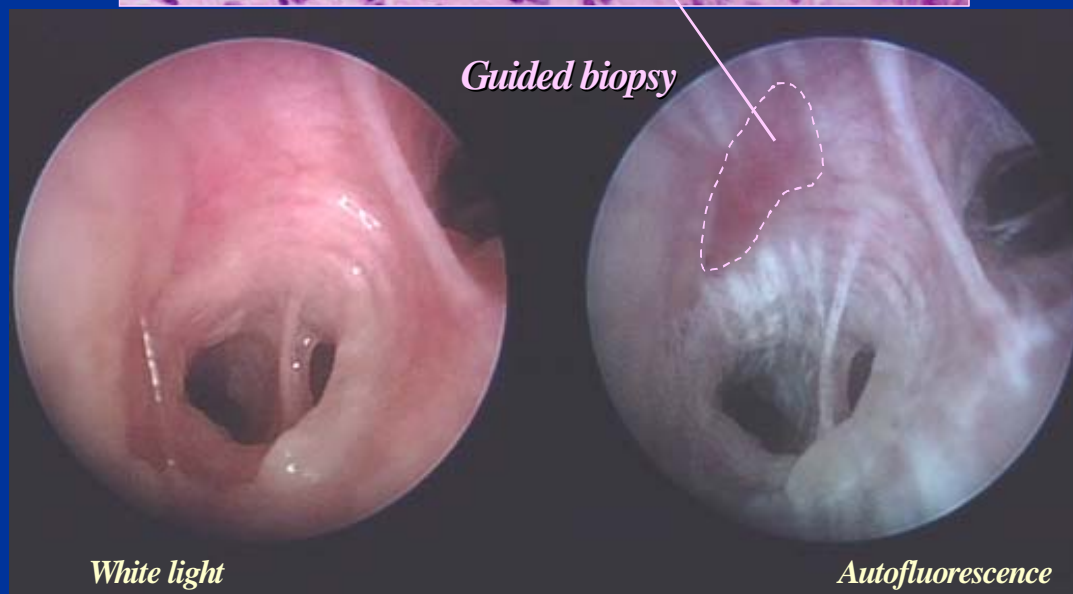
**Fluorescence Cystoscopy in the
Management of Bladder Cancer:
A Help for the Urologist!**

Pellanda A, Grosjean P, Leoni S, Mihaescu A, Monnier P, Pasche P. Abrasive esophageal cytology for the oncological follow-up of patients with head and neck cancer. Laryngoscope. 1999 Oct;109(10):1703-8.

Early detection of preneoplastic lesions in the bronchial tree through fluorescence endoscopy



DAFE® System



White light

Autofluorescence

Prevention of viral carcinogenesis: HPV vaccination

Département de Gynécologie-Obstétrique/ Institut de
Microbiologie: Denise Nardelli-Haefliger

Specific Antibody Levels at the Cervix During the Menstrual Cycle of Women Vaccinated With Human Papillomavirus 16 Virus-Like Particles

*Denise Nardelli-Haefliger, Daniel Wirthner, John T. Schiller, Douglas R. Lowy,
Allan Hildesheim, Françoise Ponci, Pierre De Grandi*

Immune responses induced by lower airway mucosal immunisation
with a human papillomavirus type 16 virus-like particle vaccine

Denise Nardelli-Haefliger^{a,*}, Floriana Lurati^{b,2}, Daniel Wirthner^{a,3}, François Spertini^{b,2},
John T. Schiller^{c,4}, Douglas R. Lowy^{c,4}, Françoise Ponci^{a,1}, Pierre De Grandi^{a,3}

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^b Division of Immunology and Allergy, Centre Hospitalier Universitaire Vaudois, CH-1011 Lausanne, Switzerland

^c Laboratory of Cellular Oncology, Center for Cancer Research, National Cancer Institute, Bethesda, MD 20892, USA

Helicobacter pylori and gastric oncogenesis

Service de Gastroentérologie: Pierre Michetti

Inflammatory Gene Profiles in Gastric Mucosa during *Helicobacter pylori* Infection in Humans¹

Sicheng Wen,* Christian P. Felley,[‡] Hanifa Bouzourene,[‡] Mark Reimers,[†] Pierre Michetti,[‡] and Qiang Pan-Hammarström^{2*}

Helicobacter pylori and gastric oncogenesis

Service de Gastroentérologie: Pierre Michetti

Oral Immunization of Mice with Lactic Acid Bacteria Producing *Helicobacter pylori* Urease B Subunit Partially Protects against Challenge with *Helicobacter felis*

Blaise Corthésy,¹ Soledad Boris,^{3a} Patrick Isler,² Corinne Grangette,³ and Annick Mercenier^{3a}

¹R&D Laboratory of the Division of Immunology and Allergy and ²Division of Gastroenterology, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland; ³Laboratory of Bacteriology of Ecosystems, Institut Pasteur de Lille, Lille, France

Safety and efficacy of *E. coli* enterotoxin adjuvant for urease-based rectal immunization against *Helicobacter pylori*

Stavros Sougioultzis^a, Cynthia K. Lee^b, Mazen Alsahli^a, Subhas Banerjee^a, Michel Cadoz^c, Robert Schrader^b, Bruno Guy^c, Philip Bedford^d, Thomas P. Monath^b, Ciaran P. Kelly^a, Pierre Michetti^{a,e,*}

^a Division of Gastroenterology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

^b Acambis Inc., Cambridge, MA, USA

^c Aventis Pasteur, Lyon, France

^d Acambis Inc., Cambridge, UK

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Biobanks provide networks of biorepositories

- large numbers of high-quality samples that can be linked with relevant clinical and pathological data
- variety of disease types
- variety of populations

What do we look for in research on human biomaterials?

- generation of new hypotheses
- genome-wide hypothesis-testing
- validation of studies in models on human disease samples
- new (molecular) diagnostic parameters

The BioBank of the Cancer Center Lausanne (BBCCL)

- has developed a working concept of a biobank
- in accordance with local, national and international (european) regulations
- will function in a national network: the 'virtual' biobank (Biobank-suisse)

Biobank procedures: the BBCCL concept

what

- informed consent
- store informed consent
- code the sample
- collect relevant non-identifying data
 - tumor type
 - patient characteristics
- retrieve data
- retrieve samples

who

attending physician
patient file and biobank
biobank/pathology
biobank/attending physician

biobank, project subject to
approval by review board

biobank