



EUROPEAN ASSOCIATION OF  
FACULTIES OF PHARMACY

University of Ljubljana  
Faculty of Pharmacy



2014 EAFP Annual Conference

# Laboratory medicine as one of the pharmacists' competencies

Borut Božič

# Examinations of the body fluids in order to recognize the state of health of the individuals

- Greco-Roman & Byzantine contribution (2<sup>th</sup>-14<sup>th</sup> c.)
  - Objectivity of observation
    - Galen: sampling and incidence
  - Guidelines comprised requirements about:
    - Space illumination: both, shadowy and luminous space
    - Equipment: transparent glass for urine examination, proper form
    - Personnel: NATURE INSPECTOR (not medical doctor)
    - Analytical and pre-analytical factors: temperature, time of sampling
- 19<sup>th</sup> century
  - Modern scientific approaches
    - Pasteur, Koch (etiology, postulates)
    - Scherer (clinical laboratory)

# Examinations of the body fluids in order to recognize the state of health of the individuals

- First half of the 20<sup>th</sup> century
  - first clinical laboratory scientists of the new era
  - clinical laboratories established in hospitals (WW1)
- Middle of the 20<sup>th</sup> century
  - demand for educated medical laboratory technologists grew
  - introduction of new, more complex methods of analysis
  - specialization in each of the clinical laboratory fields
  - different terms:
    - klinische chemie,
    - biopathology,
    - análisis clínicos,
    - biologie clinique,
    - medical biopathology

....

# Examinations of the body fluids in order to recognize the state of health of the individuals

- Last half of the 20th century
  - Clinical laboratory scientists:
    - Greater responsibility for
      - analyzing and interpreting results,
      - evaluating and implementing QA programs and new methodologies,
    - More involved in
      - laboratory management,
      - supervision,
      - education,
      - research
  - Perception about similar problems /approaches on different fields of clinical laboratory testing

# Laboratory medicine

- Term was introduced in the 90s of the last century: **“branch of medicine providing the health care system with laboratory results and related information and advice pertaining to the clinical state and treatment of health care recipients”**.
- A multidisciplinary medical and scientific specialty with several interacting subdisciplines such as:
  - haematology,
  - immunology,
  - clinical (bio)chemistry,
  - blood banking,
  - microbiology,
  - genetics and others.
- **Major component of healthcare, involved in > 70% of medical decisions**

# Medical laboratory

- ISO standard 15.189 Medical laboratories — Particular requirements for quality and competence:
  - „**medical laboratories perform examinations** for the biological, microbiological, immunological, chemical, immuno-hematological, hematological, biophysical, cytological, pathological **or other investigation of materials derived from the human body, for the purpose of providing information for the diagnosis, prevention and treatment of disease in (or assessment of the health of) human beings.**“
  - Medical laboratories also provide a consultant advisory service covering all aspects of laboratory investigation, including the interpretation of results and advice on further appropriate investigation.
  - ISO 15.189 spells out (for medical laboratories):
    - quality management requirements ([ISO 9001](#))
    - technical competence standards ([ISO/IEC 17.205](#))

# Pharmacists in laboratory medicine ?

- European experts in clinical laboratory sciences have different backgrounds
  - Survey among 30.000 professionals (20yrs ago):
    - 40% medicine (AT, IT, CH, NO, PT, HU)
    - 27% (bio)chemistry (GB, FI, SE, GR, RO, NL, SK)
    - **21% pharmacy** (FR, ES, PL, SI)
    - Great national and field variability
  - This profession has great interdisciplinary character in all countries
- Postgraduate education (specialization, PhD) in 2/3
  - developing new methods and algorithms for routine analysis
  - *in vitro diagnostics* industry
  - developing new pharmaceutical agents
    - stage of clinical development of the drug
    - goals of a particular investigation
    - different interpretation of clinical trial laboratory tests?

# Competencies/Knowledge/Curricula

- **Laboratory medicine:**

- **physics,**
- **chemistry, biochemistry,**
- **biology,**
- **anatomy,**
- histology, cytology,
- endocrinology,
- **physiology,**
- hematology,
- immunology,
- genetics, molecular biology,
- **microbiology,** parasitology,
- **pharmacology,**
- **toxicology,**
- pathology, pathophysiology,
- metrology, statistics,
- information technology
- **professional ethics and legislative**

- **Pharmacy (EU Directive):**

- **physics,**
- **chemistry (general and anorganic)**
- **organic chemistry**
- **analytical chemistry**
- **biochemistry (basic, applied, clinical)**
- **biology** (plant and animal)
- **anatomy, physiology,** medical terminology
- pharmaceutical chemistry with drug analysis
- pharmaceutical technology
- **microbiology**
- **pharmacology** and pharmacotherapy
- **toxicology**
- pharmacognosy
- **legislative and professional ethics**

- **Pharmacy (PHAR QA project):**

- Even wider



# Pharmacists in Laboratory medicine

- Small part of pharmacists are involved directly in laboratory medicine
- They represent important part of med. lab. scientists
  - especially with specialization or PhD
- Basic knowledge about production and utilization of laboratory testing results is necessary for pharmacists
  - in public or hospital pharmacies
  - in clinical pharmacy
  - in drug development
- Crosslinking the knowledge of current curricula to keep the touch with different specialties of laboratory medicine



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