Abstract # 142214_2


teaching staff

Collection and storage biological samples for long periods of time needs attention to

three

Challenge of

format of the teaching

Many studies are conducted in ongoing longitudinal population

problem

When

Interdisciplinary

New teaching tools need to be developed in this rapidly changing

and complex area of research.

Background

Molecular epidemiology is moving from an era of single marker studies to

omics driven population based studies.

The reductionist approach that most epidemiologists are being taught is failing with

the introduction of large-scale omics measurements in population studies.

This does not imply, however, that basic epidemiological principles no longer hold.

Basic concepts such as confounding, interaction, selection of the population

and measurement error are still important to consider.

They can bias the results of molecular epidemiology studies just as they do

traditional epidemiology studies, and they are often not addressed adequately

in many of the current population-based studies incorporating omics

measurements.

How can teaching in molecular epidemiology advance the field?

Teaching molecular epidemiology

Teaching those involved in molecular epidemiology is necessary.

New teaching tools need to be developed in this rapidly changing and complex area of research.

Interdisciplinary

When introducing omics in population studies, interdisciplinary collaboration is

necessary to ensure valid results. Scientists from multiple disciplines need to

understand each others languages and techniques.

This has consequences for training in molecular epidemiology with respect to:

• teaching staff

• multidisciplinary teams are needed in teaching molecular epidemiology

• students

students coming from different areas of research such as pathology, molecular biology, genetics, analytical chemistry, statistics, bioinformatics, general public health, and traditional epidemiology are seeking training in molecular epidemiology, therefore the teaching needs to be adapted to these diverse backgrounds

• format of the teaching

• three-level approach

• problem-based learning

We propose the approach outlined in the boxes

Three level approach

1. Basic concepts

2. State of the art methods

3. Increased awareness of related issues

Problem-based learning (PBL)

Constructive learning: activation of prior knowledge

Self-regulated learning: students have active role

Contextual learning: acquiring knowledge in the context of multiple disciplines

Collaborative learning: deep interactions in groups around complex problems

PBL is an ideal approach to learning for complex interdisciplinary fields

Both molecular epidemiologic research and teaching are by definition a collaborative effort.

The Maastricht Molecular Epidemiology Group (M2E2) has developed an international course “Molecular epidemiology of chronic diseases” which is a collaborative effort between scientists from multiple areas of research.

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Conclusion

Training tools characterized by interdisciplinary, and a multi-level and problem-based learning approach will shape the molecular epidemiologists of the future.

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