FEBS + EMBO Congress 2014, Paris

Workshop 1 : "What skills and key knowledge are expected from a molecular life scientist?"
Organised by FEBS Education Committee

Tuesday, Sept. 2, 18:00 – 19:30   @   Room Maillot, Level 2
Chairs: **Gül Güner** - *Izmir, Turkey* and **Frank Michealngeli** - *Birmingham, UK*

18:00 - 18:05	Introduction
18:05 – 18:20	**What skills to expect from a molecular life scientist?** Frank Michelangeli - *University of Birmingham, UK*
18:20 - 18:35	**What to teach in biochemistry? Results and prospects of a brief survey in French universities** Jean-Luc Souciet - *Université de Strasbourg et CNRS, France*
18:35 - 19:15	**Small group discussions** Facilitated by: *Keith Elliott (Manchester, UK), Winnie Eskild (Oslo, Norway), Gül Güner (Izmir, Turkey), Angel Herráez (Alcalá, Spain), Frank Michelangeli (Birmingham, UK), Jean-Luc Souciet (Strasbourg, France), Beata Vértessy (Budapest, Hungary), Tomáš Zima (Prague, Czech Republic)*
19:15 - 19:30	Panel discussion

The session was attended by about 100 participants. They split into 4 groups to discuss specific topics related to this session, as listed below. Some of the main points that were raised during the specific discussions are collected in this report.

Summary of discussions in the small groups

Group 1: What are the key practical skills that molecular life science students should learn?

The group came up with an extensive list of techniques, procedures and good practice:

- Making buffers, solutions and being able to understand concentrations.

- Using a pH meter and adjust pH of buffers.

- Knowing how to dilute solutions.

- Training in good laboratory practice (especially lab safety)

- Keeping a detailed lab book.

- Designing an experiment to test hypothesis and consideration of control and replicates.

- Being able to perform and analyse the results from SDS PAGE.

- Being able to perform and analyse the results from DNA agarose gels.

- Concepts of protein purification, i.e. size exclusion and ion exchange chromatography.

- Uv-vis spectrometry and use of calibration curves.

- Enzyme assays and following rates of reactions.

- Basic microbiology techniques also expose to other model organism systems ie yeast or flies, etc.

- Undertaking PCR reactions and analyzing products.

- Searching scientific literature data bases.

Group 2: What are the key transferable skills that molecular life science students should learn?

- Mathematical competency. Being able to use and manipulate simple equations.

- Being able to plot and interpret data in the form of graphs and tables.

- Statistics and its uses. Being able to ulitilise statistical software, i.e. Excel, SPSS, Minitab, etc.

- Communication skills, oral presentations and in writing.

- Scientific writing, how to write a scientific report or paper.

- Problem solving skills – i.e. critical analysis, experimental design and setup.

- Team working skills.

- Independency and time management.

- Leadership and managerial skills.

Group 3: Careers and improving employability prospects

- Have an extensive period of workplace experience as part of the degree. This could take the form of a "sandwich year" where the students spend one academic year working in an industrial setting such as for a pharmaceutical company.

- Coaching and mentoring.

- Helping with CV writing.

- Helping to develop interview skills.

- Employ or utilize specific careers officers within the university to help students with applications.

- Organise careers fairs for the students and invite past graduates to talk about their careers following graduation.

Group 4: Subject-specific knowledge

- Proteins

- DNA / RNA / Genetics

- Enzymes

- Metabolism

- Regulation

- Cell biology

- Molecular biology

- Bio-energetics

- Membranes

- Cell signaling

- Biotechnology

- Microbiology

- Molecular pharmacology