

## Training Molecular Biology - Course E101

This course conveys comprehensive expert knowledge for methods in molecular biology. The course is suitable for beginners as well as for more experienced users, who wish to extend their knowledge on innovative methods and to overcome common problems. The acquired knowledge is useful to plan molecular biology experiments properly and to avoid, recognize and fix typical errors.

The course starts with fundamentals of cell biology and molecular genetics and will explain cellular processes, from genomic DNA via transcription and translation to the functional protein, step by step. On this basis, molecular biological methods for extraction, modification and analysis of nucleic acids as well as expression and analysis of recombinant proteins will be reviewed. A number of further commonly used methods will be presented additionally.

The participants will conduct numerous experiments concomitant to the theoretical topics in order to gain practical experience. A glossary of important molecular biology terms supplements the course. It is possible to include individual topics in the course program.

The course focuses mainly on:

- Molecular cell biology and molecular genetics
- Common skills in the molecular biology lab (incl. proper pipetting)
- Isolation and handling of sample material for molecular biology analysis
- Nucleic acid extraction techniques (incl. DNA, RNA)
- Qualitative and quantitative analysis of nucleic acids (incl. photometry, fluorimetry, gel electrophoresis)
- Reverse transcription and *in-vitro* transcription
- PCR (incl. primer design and optimization)
- Real-time PCR and applications (incl. absolute and relative quantification, HRM)
- Plasmid preparation, restriction digest and conventional cloning
- Current cloning techniques (incl. recombination, assembly cloning)
- Gene transfer (incl. transformation, transfection, viral transduction)
- Guidelines for working with GMOs (genetically modified organism)
- Sequencing and sequence analysis (incl. Next Generation Sequencing)
- Hybridization techniques (incl. microarray, *in situ* hybridization)
- RNA interference
- Genome editing (incl. CRISPR/Cas)
- Recombinant protein expression and analysis (incl. ELISA, Immuno-Blot)
- Data base research (incl. NCBI) and important bioinformatics tools

***No special previous knowledge is required for this course.***

**Duration: 5 days** (beginning: 9:30 a.m. - end: 5:00 p.m.)

**Course fee: € 1,450.00** (plus 19% VAT) incl. work materials, course documentation, confirmation of participation including detailed course contents, lunch, snacks and beverages.

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## LAB-ACADEMY

Dr. Battke SCIENTIA GmbH  
Life Science Services

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**Optional final examination:** On demand, a final examination can be taken subsequently to the course. The examination fee is € 125,00 (plus 19% VAT) and is not included in the participation fee.

The examination will be held after the end of the course (Friday 4:30 to 5:30 p.m.) or at a date fixed optionally. Registration for the examination is possible together with booking the course or also during the course.

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