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“Single-Molecule, Real-Time (SMRT™) DNA Sequencing: Technology Update and Recent Applications”

17 March 2015, 11:00 h (s.t.)

Venue: 2nd Floor Seminar Room

Institute of Molecular Biology (IMB)

Johannes Gutenberg University Campus Mainz

All are welcome to attend

Abstract:

Single-Molecule, Real-Time (SMRT™) DNA Sequencing: Technology Update and Recent Applications

Understanding the dynamics of biological processes is fundamental to understanding life itself. At Pacific Biosciences, we are developing applications to observe individual biomolecules at work in real time in nanostructures. The first is monitoring DNA synthesis by single DNA polymerase molecules, allowing the speed, processivity, and efficiency of the enzyme to be exploited for new capabilities in DNA sequencing. The power of this new sequencing technology - characterized by very long readlengths (more than 30,000 bp) and fast run times - is highlighted through examples from diverse applications, such as finishing genomes (de novo assembly), targeted resequencing and haplophasing of difficult to sequence regions like GC- or AT-rich, resolving complex genomic regions (repeats, indels, HLA), characterizing transcript and gene fusion diversity, rapid pathogen sequencing, and the direct detection of epigenetic base modifications by making use of the kinetic information collected during DNA-sequencing.