

Post-Doctoral Fellowship  
**Individual-based Modeling of Biofilms**  
Technical University of Denmark

The **RaMAda** project (Rapid Microbial Adaptation via Horizontal Gene Transfer) aims to predict and quantify the incidence of extant horizontal gene transfer (HGT) in microbial biofilm communities. This project has both an experimental and numerical-computational element. Molecular biomarkers and confocal scanning laser microscopy are employed for single-cell resolved detection of microbial growth and gene transfer dynamics. Experimentation is conducted in parallel with the development of an Individual-based (Ib) model of microbial biofilms that incorporates a description of gene transfer dynamics. These Ib models are based on the simulation of interacting elementary agents (here the bacteria themselves) to exhibit the probable origin of emergent properties and patterns.

**The postdoctoral fellow will join a resident team of researchers and lead the computational element of the project. The goals are to establish robust procedures to identify and estimate input parameters to Ib models for microbial growth and gene transfer dynamics, to extend the features of our existing Ib software platform (iDynoMiCs), and to evaluate the predictive ability of Individual-based models for microbial biofilm systems.**

The applicants will join the Microbial Ecology Research Group at the Institute of Environment & Resources at the Technical University of Denmark (E&R DTU), and work under the supervision of Prof. Barth F. Smets. E&R DTU offers state-of-the art facilities and equipment to execute this project. The modeling efforts occur in close collaboration with Dr. J. U. Kreft at the University of Birmingham (UK).

The successful candidates will have a high motivation for research and solid written/spoken communication skills. The applicants will enjoy working in and contributing to an international and cross-disciplinary team, and enjoy periodic research exchanges at other European Universities.

At the date of appointment, candidates must have at least 4 (but less than 10) years of relevant research experience (counted from the time of obtaining a degree allowing access to doctoral studies in same country) or a PhD degree (Microbiology/Environmental Science/Ecology Bio/Environmental/Chemical Engineering, Control Science, Applied Mathematics or related discipline), and evidence of research productivity, with expertise in one of the following fields: **mathematical modeling and computational analysis applied to environmental/microbial/biochemical systems.**

Initial appointment will be for a period of 12 months, with anticipated extension up to 24 months, pending performance. Salary will be at EU scale, with vacation and full health benefits, and possibility for mobility and travel allowance. Applications will be accepted until the positions are filled, but a start date of ultimo Feb. 01, 2008 is preferred.

Applications should be electronic and should include a letter of intent, a CV, a statement describing research expertise and interests, 2 to 3 key original research articles, and a list of three academic referees. All information should be attached as one pdf file.

For any further information or applications, please contact: Prof. Barth F. Smets ([bfs@er.dtu.dk](mailto:bfs@er.dtu.dk)) or Dr. Laurent Lardon ([lal@er.dtu.dk](mailto:lal@er.dtu.dk)).

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