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CeNT CENTRE
OF NEW
TECHNOLOGIES

invites to a seminar by

Prof. Matthias Bochtler

International Institute of Molecular and Cell Biology in Warsaw
The Institute of Biochemistry and Biophysics (IBB)

The vocabulary of protein-DNA interactions: Symmetry, degeneracy, modifications

14th of June 2018 at 12 p.m.

Venue: Centre of New Technologies, Banacha 2C
Lecture Hall 01.42 (ground floor)

Host: Joanna Sułkowska

The basics of protein nucleic acid interactions have been worked out a long time ago (1), but new themes are still emerging. In my talk, I will emphasize the DNA structure and symmetry, degenerate protein-DNA interactions (2,3), and the specific recognition of modified DNA bases (4-6). Using examples from our own work, I will cover indirect sequence readout, sequence readout by intercalation (7), or single and double nucleotide flipping (2,8,9), and the readout of DNA modifications by hydrophobic interactions and modification induced DNA distortions (4,5).

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3. Sokolowska, M., Kaus-Drobek, M., Czapinska, H., Tamulaitis, G., Szczepanowski, R.H., Urbanke, C., Siksnys, V. and Bochtler, M. (2007) Monomeric restriction endonuclease BcnI in the apo form and in an asymmetric complex with target DNA. *J Mol Biol*, **369**, 722-734.
4. Mierzejewska, K., Siwek, W., Czapinska, H., Kaus-Drobek, M., Radlinska, M., Skowronek, K., Bujnicki, J.M., Dadlez, M. and Bochtler, M. (2014) Structural basis of the methylation specificity of R.DpnI. *Nucleic Acids Res*, **42**, 8745-8754.
5. Siwek, W., Czapinska, H., Bochtler, M., Bujnicki, J.M. and Skowronek, K. (2012) Crystal structure and mechanism of action of the N6-methyladenine-dependent type IIM restriction endonuclease R.DpnI. *Nucleic Acids Res*, **40**, 7563-7572.
6. Kazrani, A.A., Kowalska, M., Czapinska, H. and Bochtler, M. (2014) Crystal structure of the 5hmC specific endonuclease PvuRts11. *Nucleic Acids Res*, **42**, 5929-5936.
7. Firczuk, M., Wojciechowski, M., Czapinska, H. and Bochtler, M. (2011) DNA intercalation without flipping in the specific Thal-DNA complex. *Nucleic Acids Res*, **39**, 744-754.
8. Bochtler, M., Szczepanowski, R.H., Tamulaitis, G., Grazulis, S., Czapinska, H., Manakova, E. and Siksnys, V. (2006) Nucleotide flips determine the specificity of the Ecl18kI restriction endonuclease. *EMBO J*, **25**, 2219-2229.
9. Wojciechowski, M., Czapinska, H. and Bochtler, M. (2013) CpG underrepresentation and the bacterial CpG-specific DNA methyltransferase M.MpeI. *Proc Natl Acad Sci U S A*, **110**, 105-110.