

Master " Sciences, Technology, Health

MASTER M2 BI « *In Silico* Drug Design »

2ème année

INTERNSHIP SUBJECT

Academic Year 2021 / 2022



Name of the Laboratory Manager: Arto Urtti

Laboratory: Ocular Drug Delivery

Precise address of the Laboratory : Faculty of Pharmacy, University of Eastern Finland, Yliopistonranta 1 A, 70211 Kuopio, Finland

Name of the host team leader and name of the team

Arto Urtti, Ocular Drug Delivery

Name of Internship Leader(s): Veli-Pekka Ranta, Eva del Amo

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Specialty of the internship : Research / international

Is this topic a first step towards a thesis: yes

Indicate by a few key words, the scientific orientation of the subject: pharmacokinetics, pharmaceutics, computational modeling

Title: Ocular pharmacokinetic modeling

Project Summary (15 lines):

Ocular pharmacokinetics of brinzolamide has been studied in details using rabbits as animal models. This insldues concentration profiles of the drug in various eye tissues after topical eye drop administration. Furthermore, we shall obtain drug response data for intraocular pressure reductio.

The project will involve a) learning of the pharmacokinetics in the eye and simple model building top-down to fit the brinzolamide's pharmacokinetic data; b) obtaining relevant kinetic parameters; c) building the optimized pharmacokinetic model; d) handling the pharmacodynamic drug response data for pharmacodynamic modeling; e) building pharmacokinetic/pharmacodynamic model; f) validation of the model in comparison with the experimental data.

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University of Eastern Finland will provide the supervision (Drs. Veli-Pekka Ranta, Eva Del Amo, Arto Urtti), computer and software that is needed for the modeling work.

References :

Cristiana Correia, Abigail Ferreira, Joana Santos, Rui Lapa, Marjo Yliperttula, Arto Urtti, Nuno Vale. New In Vitro-In Silico Approach for the Prediction of In Vivo Performance of Drug Combinations. *Molecules* 2021, 26 (14) , 4257. <https://doi.org/10.3390/molecules26144257>

Vellonen, KS, Soini, EM, Del Amo, EM, Urtti, A. Prediction of ocular drug distribution from systemic blood circulation. *Mol. Pharm.* 13: 2906-2911 (2016).

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