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FACULTEIT GENEESKUNDE EN FARMACIE

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UITNODIGING

Voor de openbare verdediging van het doctoraatsproefschrift van

Matthias BAUWENS

donderdag 5 maart 2009

U wordt vriendelijk uitgenodigd op de openbare verdediging van het proefschrift van

Matthias BAUWENS

'Radioiodinated D aromatic amino acid analogues as potential cancer theragnostics'

Op **donderdag 5 maart 2009** om **18 uur**
in auditorium **R. Vanden Driessche**
Faculteit Geneeskunde & Farmacie,
Laarbeeklaan 103, 1090 Brussel

Situering van het proefschrift

The LAT1 amino acid transport system, over-expressed in many tumour types, has become an important key in tumour imaging using radiolabeled amino acids. Since some neutral D-enantiomeric amino acids can be taken up through the LAT1 system but not by other amino acid transporters, they have a potential as specific tumour tracers as well as radiotherapeutic agents.
In this thesis, radioiodinated D-tyrosine and D-phenylalanine were evaluated and compared with their L-analogues. It was established that both [^{123}I]-2-I-D-tyrosine and [^{123}I]-2-I-D-phenylalanine were taken up in tumour cells via the LAT1 transporter. We found that Phe analogues are superior to Tyr analogues in vivo in terms of tumour residence time and tumour/background contrast at later time points.
[^{123}I]-2-I-D-phenylalanine was found to display a favourable biodistribution and dosimetry in human test subjects, with a lower effective dose compared to [^{123}I]-2-I-L-phenylalanine. Finally, [^{131}I]-2-I-D-phenylalanine, evaluated as a potential therapeutic compound in a R1M tumour bearing mouse model, significantly reduced the tumour growth in the treated animals, without substantial side effects.

In conclusion, [^{123}/^{131}I]-2-I-D-phenylalanine shows the promising properties to become a potential cancer theragnostic.

Curriculum Vitae

Matthias Bauwens was born on 7 September 1980 in Lüdenscheid, Germany. He studied Industrial Engineering in Biochemistry at the Katholieke Hogeschool Brugge-Oostende, where he graduated with distinction in 2002. Directly after, he started his PhD in Medical Sciences in the department of Radiopharmaceutical Chemistry at the Vrije Universiteit Brussel. He simultaneously graduated with great distinction at the same university as a 'Master in Medical and Pharmaceutical Research' in 2004.

His research topic was the development and evaluation of radioactive labelled amino acid analogues with respect to specific tumour imaging and systemic radionuclide therapy, coupled to fundamental research into the relevant amino acid transport systems. This work resulted in several publications, which were merged into the current thesis.