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## Carcinogenicity of insulin analogues

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# Dankwoord

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## ◀ IN THE PICTURE

In science, and especially in the laboratory of Toxicology, there is a strong trend to scale up the experiments. “If the insulin receptor downstream signalling pathway has 200 targets, why test one if you can test all of them?” It is impossible to perform these high throughput experiments with manual pipetting alone. The liquid handler in the picture can be programmed to pipette 96 individual wells all at once, which saves time and physical problems like a pipetting hand.

## ◀ IN BEELD

In het onderzoek, en vooral bij de afdeling Toxicologie worden de experimenten steeds groter opgezet. “Als de insuline receptor pathway 200 moleculen bevat, waarom zou je er maar één testen als je ze ook allemaal zou kunnen testen?”. Het zou onmogelijk zijn om deze grootschalige experimenten allemaal met de hand te pipetteren. De automatische pipeteer robot op de foto kan 96 individuele welletjes tegelijk pipeteren. Qua tijdsinvestering maar ook uit ergonomisch oogpunt is dit gunstiger.

**Curriculum Vitae**

Bas (Sebastiaan Johannes) ter Braak was born in Zelhem, The Netherlands, on August 11<sup>th</sup> 1987. He went to the Ulenhof College in Doetinchem, where he obtained his VWO diploma in 2005, with majors in *Natuur en Gezondheid* and *Natuur en Techniek*.

In 2005, he started his study Biotechnology at Wageningen University. During his academic studies, he completed three graduation Master projects. During a thesis project at the Laboratory of Microbiology of this University he studied the reactivation of inactive genes in *Aspergillus niger*. During his internship at the Bioengineering Research Group of Instituto Superior Técnico (Lisbon Technical University, Portugal), supported by the Erasmus grant, he studied the impact of downstream processing of plasmid on transient transfection in mammalian cells. Bas finished his studies with a second Master thesis at the Biology department of O. Wayne Rollins Research Center (Emory University, Atlanta, USA) where he studied the influence of secondary symbionts in the pea aphid immune system, which was supported by the *Middelhofenfonds*.

Directly after completing his studies in September 2010, he started working as a PhD at the Leiden Academic Center for Drug Research at the Leiden University, on the project "Carcinogenicity of insulin analogues". This project was carried out under the supervision of prof. dr. Bob van de Water, Dr. Jan Willem van der Laan and Dr. Kris Siezen. Since May 2015 he is employed as a post-doctoral researcher at the same department on a project in which cell signalling reporter stem cell models are established for the mechanistic understanding of liver disease.

**Contact Information**

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## List of publications

### *Carcinogenicity of Biopharmaceuticals*

Dempster M, Siezen K, **Ter Braak B**, van den Brink W, Emerenciana A, Bellanti F, Duijnhoven RG, Kwa M, Van der Laan JW. *In press March 2015*, "Genotoxicity and Carcinogenicity Testing of Pharmaceuticals", Springer Press (book chapter)

Insulin treatment and breast cancer risk; a review of in vitro, animal and human evidence

**Ter Braak B**<sup>\*</sup>, Bronsveld HK<sup>\*</sup>, Karlstad Ø, Vestergaard P, Starup-Linde J, Bazelier MT, De Bruin ML, De Boer A, Siezen CLE, Van de Water B, Van der Laan JW, Schmidt MK

<sup>\*</sup> *Both authors contributed equally*. In review (March 2015), Breast Cancer Research

### *Alternative signalling network activation through different insulin receptor family members caused by pro-mitogenic antidiabetic insulin analogues in human mammary epithelial cells*

**Ter Braak B**, Wink S, Koedoot E, Pont C, Siezen CL, Van der Laan JW, Van de Water B

In review (Februari 2015) Breast Cancer Research

### *Mammary gland tumor promotion by chronic 3 administration of IGF1 and the insulin analogue AspB10 in the p53<sup>R270H/+</sup>WAPCre mouse model*

**Ter Braak B**, Siezen CLE, Speksnijder EN, Koedoot E, Van Steeg H, Salvatori DCF, Van de Water B and Van der Laan JW

Breast Cancer Research, March 2015, doi:10.1186/s13058-015-0518-y

### *Tumorigenic insulin analogues promote mammary gland tumor development by increasing glycolysis and promoting biomass production*

**Ter Braak B**, Siezen CLE, Lee J, Rao P, Voorhoeve C, Ruppin E, Van der Laan JW, Van de Water  
Manuscript in preparation.

Classifying the adverse mitogenic mode of action of insulin analogues using a novel mechanism-based genetically engineered human breast cancer cell panel.

**Ter Braak B**, Siezen CL, Kannegieter N, Koedoot E, van de Water B, van der Laan JW.

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De La Vega J, **Ter Braak B**, Azzoni AR, Monteiro GA, Prazeres DM.

J Pharm Sci. 2013 Nov;102(11):3932-41. doi: 10.1002/jps.23709. Epub 2013 Aug 28. PMID: 23996350

Exposure to bacterial signals does not alter pea aphids' survival upon a second challenge or investment in production of winged offspring.

**Ter Braak B**, Laughton AM, Altincicek B, Parker BJ, Gerardo NM.

PLoS One. 2013 Aug 29;8(8):e73600. doi: 10.1371/journal.pone.0073600. eCollection 2013. PMID:24009760

Escherichia coli K-12 pathogenicity in the pea aphid, *Acyrtosidpon pisum*, reveals reduced antibacterial defense in aphids.

Altincicek B, **Ter Braak B**, Laughton AM, Udekwu KI, Gerardo NM.

Dev Comp Immunol. 2011 Oct;35(10):1091-7. doi: 10.1016/j.dci.2011.03.017. Epub 2011 Apr 20. PMID:21527277