

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/19756> holds various files of this Leiden University dissertation.

**Author:** Naber, Hildegonda Petronella Henriëtte

**Title:** TGF-beta and BMP in breast cancer cell invasion

**Issue Date:** 2012-09-05

## Stellingen

1. The spheroid assay provides a good method for the study of TGF- $\beta$ -induced invasion of breast cancer cells in a 3D environment because the malignancy of cells is correlated with invasion (this thesis).
2. MMP2 and MMP9 enzymatic activity is necessary for TGF- $\beta$ -induced invasion in a 3D environment (this thesis)
3. Integrin  $\alpha_3$  expression rescues the inhibitory effect of BMP-7 on TGF- $\beta$  induced invasion and can therefore be considered as a hub in the crosstalk between TGF- $\beta$  en BMP-7 (this thesis)
4. Overexpression of transcription factors involved in EMT, Slug and Snail, enhances breast cancer cell invasion in a 3D environment (this thesis).
5. Cancer stem cells may have arisen from cancer cells which have undergone EMT, because cells which have undergone EMT express cancer stem cell markers (Mani et al *Cell* 2008 133:704-715)
6. Essential cellular functions that are present in tissues are missed by 'petri dish'-based cell cultures, because tissues are not 2 dimensional (Pampaloni et al *Nat Rev Mol Cell Biol* 2007 8:839-845)
7. Colonization of distant organ seems to be the rate-limiting step in metastasis; only a few cancer stem cells can do the job (Malanchi et al *Nature* 2012 481: 85–89)
8. When a plant goes to seed, its seeds are carried in all directions; but they can only live and grow if they fall in congenial soil (Paget *Lancet* 1889 1:571-573)
9. The thin line between geniality and mental disease is determined by the number of dopamine receptors in the thalamus (de Manzano et al *PloS One* 2010 5:e10670)
10. A PhD is like gardening; the soil is important for growth, the position determines the blooming, most experiments fail and you are bothered by Slugs and Snails.
11. E-mails can be interpreted in several ways; a smiling face can not.