

Propositions – *Stellingen*

behorende bij het proefschrift “Testis-specific protein kinases TSSK1 and TSSK2 in mouse spermiogenesis”

- 1- *Tssk1/2* double knockout mice demonstrate that loss of the encoded testis-specific kinases results exclusively in a male infertility phenotype. (this thesis)
- 2- Mouse TSSK1 and TSSK2 are essential for chromatoid body transformation during spermatid elongation. (this thesis)
- 3- Chromatoid body transformation in spermatids is not only a morphological transformation, but also involves a functional transformation. (this thesis)
- 4- *Tssk1* and *Tssk2* are a pair of duplicated genes, where the encoded proteins, TSSK1 and TSSK2, have gained some divergent functions. (this thesis)
- 5- In primates, a gene duplication event of *Tssk1* which created *Tssk1B* has accelerated the evolutionary rate of both *Tssk1B* and *Tssk2*. (this thesis)
- 6- TSSK1 and TSSK2 are druggable targets for non-hormonal male contraceptives.
- 7- The ability to culture human spermatogonia would enable gene therapy to be carried out even before the embryo starts to develop, thus allowing timely repair of certain genetic defects carried by the father and which are known to lead to disease phenotypes in the offspring.
Kurita K. *et al.* (2004) Transgenic zebrafish produced by retroviral infection of *in vitro*-cultured sperm. *PNAS* 101: 1263-1267.
- 8- CRISPR-Cas9-mediated genome editing is possible in adult animals and has potential for prevention of symptoms of human genetic diseases.
Yin H. *et al.* (2014) *Nature Biotechnology* 32: 551-553.
- 9- Our knowledge of the principles by which organ architecture develops through complex collective cell behaviors is still limited. (...) The hope is to manipulate complex multicellular behaviors (...). Although this is a longer-term goal, I am rather optimistic about it.
Yoshiki Sasai (2013) *Nature* 493: 318-326.
- 10- The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom.
Isaac Asimov (1920-1992)
- 11- 知之为知之，不知为不知，是知也。《论语·为政》
(When you know a thing, to hold that you know it; and when you do not know a thing, to admit that you do not know it; this is the wisdom)
The Analects of Confucius (written ca. 500 BCE)

Peng Shang, December 9, 2014