



CDB SEMINAR

Tomohiro Sasanami

Department of Applied Biological Chemistry, Faculty of Agriculture, Shizuoka University

Tuesday, December 2, 2014

16:00~17:00 Auditorium C1F

Unique mechanisms of successful fertilization in birds

Summary

Fertilization is an indispensable step for formation of a zygote in sexual reproduction, leading to species survival. In birds, several unique mechanisms such as polyspermic fertilization and sperm storage in the oviduct are employed in the process of the fertilization. The ejaculated sperm are stored in the oviductal sperm storage tubules (SST) in a quiescent state until use for fertilization. Because of the presence of the SST, once ejaculated sperm have entered the female reproductive tract they can survive for a prolonged periods in domestic birds. However, the specific mechanisms involved in the sperm uptake into, maintenance within, and controlled release from the SST remain to be elucidated. We show in Japanese quail that the SST release large amounts of lactic acid that leads to cytoplasmic acidification of the resident sperm and inactivation of flagellar dynein ATPase, thus resulting in quiescence of the resident sperm in the SST. The electron microscopical observations of the SST indicated that the resident sperm are released from the SST in a regulated manner during the ovulatory cycle. When laying birds were injected with progesterone, most of the sperm were released from the SST within 1 hr of injection with a contraction-like morphological change of the SST. These results indicated that the progesterone acts as a sperm-releasing factor from the SST in birds. Also, we would like to introduce our recent findings that the full-term development and birth of healthy quail chicks is accomplished via injection of a single spermatozoon by mimicking polyspermic fertilization *in vitro*.

Host:

Guojun Sheng

Early Embryogenesis,
CDB

sheng@cdb.riken.jp

Tel:078-306-3132

(ext:4201)

RIKEN CENTER for DEVELOPMENTAL BIOLOGY (CDB)