

Compulsory course work PhD focus “Reproduction”

First study year:

1.1 Reproductive endocrinology

- 1.1.1 Basics in reproductive endocrinology - *Schmicke*
- 1.1.2 Evaluation of clinical and in-vitro studies in reproductive endocrinology - *Schmicke*
- 1.1.3 Methods of hormone measurement –lab course - *Schmicke*

1.2 Sexual development and gamete production

- 1.2.1 Spermatogenesis and oogenesis in farm animals - *Niemann*
- 1.2.2 Stem cells in farm animals – *Niemann*
- 1.2.3 Genetics of sexual development – *Distl*

1.3 Current principles in male /female reproduction

- 1.3.1 Anatomy and histology of the male and female sexual organs – a view through the virtual microscope – *Brehm, Pfarrer*
- 1.3.2 Embryology of the male and female sexual organs – *Brehm*
- 1.3.3 Histology: from tissue sampling to microscopy – lab course – *Brehm*
- 1.3.4 Immunohistochemistry / Immunofluorescence – lab course – *Brehm*
- 1.3.5 Influence of pregnancy on female reproductive organs (incl. comparative placentation) – *Pfarrer*
- 1.3.6 Techniques in spermatology – lab course– *Waberski*
- 1.3.7 Preservation of mammalian cells and tissues – *Wolkers, Oldenhof, Sieme*
- 1.3.8- Techniques for examination of the reproductive tract –practical course– *Sieme*
- 1.3.9 Genomics, transcriptomics and cytogenetics of reproduction – lab course – *Metzger, Distl*
- 1.3.10 The laboratory mouse: a model species for reproductive research – *Kues*

Second study year:

2.1 Biotechnology in reproduction, Part I

- 2.1.1 Reproductive biotechnologies (ET, IVP, Sexing, Cloning) – *Niemann*
- 2.1.2 Gender separation techniques - *Rath*
- 2.1.3 Artificial insemination – *Waberski*

2.2 Reproductive immunology

- 2.2.1 Insemination-induced immunomodulation -*Schuberth*
- 2.2.2 Fertility and the immune system - *Schuberth*
- 2.2.3 Immune mechanisms during pregnancy - *Schuberth*
- 2.2.4 Immunology of the newborn - *Schuberth*

2.3 Reproductive disorders

- 2.3.1 Endocrine disorders in reproduction – *Schmicke*

- 2.3.2 Infertility and disturbed spermatogenesis – *Brehm*
- 2.3.3 Pathology of gestation and parturition – *Bajcsy*
- 2.3.4 Pathology of the puerperium – *Heppelmann*
- 2.3.5 Disorders of sexual development and genetics of reproductive disorders – *Distl, Metzger*
- 2.3.6 Intermediary metabolism and negative energy balance in dairy cows – *Breves*

Third study year:

3.1 Biotechnology in reproduction, Part II

- 3.1.1 Transgenesis, Genome Editing, Genomic selection (GBV) - *Niemann*