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Research interest:

I directed my research interests towards neuroendocrine mechanisms responsible for occurrence annual changes in metabolic and reproductive processes in sheep. The studies are analysed relationships between anorexigenic system (resistin, leptin, serotonin and its 2B/2C receptors) and orexigenic (orexin and ghrelin) at the level of the hypothalamus, pituitary gland, pineal gland and periphery during spring-summer (long photoperiod) and autumn-winter (short photoperiod). In the same periods the phenomenon of seasonal leptin resistance and changes in expression of signaling cytokine inhibitors (SOCS-3) are being investigated in selected tissues in sheep.

Research experience:

SCIENTIFIC COMMITTEE RESEARCH GRANTS:

1. "Regulatory role in sheep of orexin A in the biosynthesis processes and releasing of melatonin", a grant from the Polish National Research Council No. 2017/01/X/NZ9/00204 – **Manager and General Contractor (2017)**
2. "Influence of orexin A central injections on the secretory activity of the pituitary gland of sheep", a grant from the Agricultural University in Krakow, BM-4269/KBZ/2017 – **Manager and General Contractor (2017)**
3. "Determination of factors determining leptin transition through the blood-brain barrier and leptin resistance", a grant from the Polish National Research Council No. 2015/19/B/NZ9/01314 – **Contractor (2016-2019)**
4. "Determination of interactions between ghrelin and serotonin in sheep", a grant from the Agricultural University in Krakow, BM-4241/KBZ/2015 – **Manager and General Contractor (2015)**
5. "Investigation of mechanisms of leptin-resistance induced by pregnancy in sheep", a grant from the Polish National Research Council No. 2013/09/B/NZ4/01532 – **Contractor (2014-2017)**
6. "Role of serotonin in the ghrelin's stimulation melatonin secretion in sheep", a grant from the Polish National Research Council No. 2013/05/B/NZ4/02408 **– General Contractor (2013-2015)**
7. "Interactions between key peptides involved in the regulation of energy homeostasis in sheep", a grant from the Agricultural University in Krakow, BM-4227/KHTChiMP/2013 - **Manager and General Contractor (2013)**
8. "Determination of interactions between leptin and key-peptides engaged in energy homeostasis in sheep", a grant from the Polish National Research Council No N N311 318436 – **Contractor (2009-2011)**

SOME OF THE TRAINING AND COURSES:

Dec 2015	Training entitling to planning and execution of procedures and experiments on animals as well as to the killing of experimental animals, as per Polish Society of Laboratory Animal Science.
Jun 2014	"Summer school of embryonic stem cells cultures techniques", Department of Transplantology, Polish American Institute of Pediatrics, Jagiellonian University Medical College, Krakow.
Jan 2013	Laboratory Chemical Safety and Biological Safety Courses, University of British Columbia, Vancouver.
Jan 2013	Lentiviral Biosafety Course, University of British Columbia, Vancouver.
Sept 2012	"Summer course of cell cultures techniques", Department of Cytology. Faculty of Biology. Warsaw University.

Training in the field of molecular biology methods such as **Real-Time PCR, Western-blot and ELISA**

Visiting Scholar:

1. Texas A&M University, Agriculture and Life Sciences, Department of Animal Science, Physiology of Reproduction Section. Position: **intern**, working on project: "Investigation of the effects of perinatal nutrition on reproductive neuroendocrine function in female ruminants" (Nov – Dec 2017).
2. Faculty of Land and Food Systems, University of British Columbia, Vancouver, Canada. Position: **recipient of the Dekaban Foundation Scholarship**, working on project: "The effects of zinc-depletion on the expression of apoptotic regulator at the protein level in human breast cancer MDA-MB-231 cells" (Jan – Jun 2013)

Education:

PhD in the field of Animal Sciences and Biology at the Faculty of Mathematics and Natural Sciences**,** Jan Kochanowski University in Kielce (8th of April 2015)

Special Postgraduate Studies in Pedagogical Center of Pedagogy and Psychology at the Krakow University of Technology (2017-2018)

Special Postgraduate Studies in Molecular Biology at the Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University in Krakow (2008-2009)

Higher education: Master of Sciences, majoring in biology of Animal Reproduction at the Faculty of Animal Sciences,

Agricultural University in Krakow (2001-2006)

Professional profiles:

ORCID: http://orcid.org/....
Mendeley: https://www.mendeley.com/profiles/...
Research Gate: https://www.researchgate.net/profile/...
Google Scholar: http://scholar.google.com/citations...

List of publications:

1. **Kirsz K.,** Szczesna M., Biernat W., Molik E., Zieba D.A., 2020, Involvement of orexin A in nocturnal melatonin secretion into the cerebrospinal fluid and the blood plasma in seasonal sheep. Gen Comp Endocrinol. 15286:113304. doi: 10.1016/j.ygcen.2019.113304.

2. Szczęsna M., **Kirsz K**., Misztal T., Zieba D.A., 2019, Pregnancy-induced changes in the transcript levels of prolactin receptor and its suppressor in the ovine hypothalamus and adenohypophysis. Reprod Domest Anim. 55(1):21-28.

3. Zieba D.A., Biernat W., Szczesna M., **Kirsz K.,** Misztal T., 2019, Hypothalamic-pituitary and adipose tissue responses to the effect of resisitn in sheep: the integration of leptin and resisitn signaling involving a suppressor of cytokine signaling 3 and the long form of the leptin receptor. Nutrients, 11, 2180.

4. **Kirsz K.,** Szczesna M., Bochenska A., Pietsch-Fulbiszewska A., Sowinska N., Kabala N., Zieba D.A., 2019, Effects of central orexin A on gonadotropins and progesterone secretion in ewes during the luteal phase of the estrous cycle and during anestrus. Small Ruminant Research 177, 82–88.

5. Szczesna M., **Kirsz K.,** Misztal T., Zieba D.A., 2019, Downregulation of LRb in VMH/DMH during the second half of gestation and upregulation of SOCS-3 in ARC in late-pregnant ewes - Implications for leptin resistance. Gen. Comp. Endocrinol. 274:73-79.

6. Biernat W., **Kirsz K.,** Szczesna M., Zieba D.A., 2018, Resistin regulates reproductive hormone secretion from the ovine adenohypophysis depending on season. Domest. Anim. Endocrinol. 65:95-100.

7. Szczesna M., **Kirsz K.,** Misztal T., Molik E., Zieba D.A., 2018, The effects of leptin on plasma concentrations of prolactin, growth hormone, and melatonin vary depending on the stage of pregnancy in sheep. J. Anim. Sci. 96(8):3348-3357.

8. **Kirsz K.,** Szczesna M., Molik E., Zieba D.A., 2017, Effects of ghrelin on nocturnal melatonin secretion in sheep: An in vitro and in vivo approach. J. Anim. Sci. 95(9):4101-4112.

9. **Kirsz K.,** Szczesna M., Molik E., Misztal T., Zieba D.A., 2017, Induction of LH and GH secretion by orexin A and ghrelin is controlled in vivo by leptin and photoperiod in sheep. Annals of Animal Science 17, 155–168.

10. **Kirsz, K.,** Szczesna, M., Borsuk, A., Zieba D. A., 2017, Cross-talk between leptin, ghrelin and orexins in the central nervous system of seasonal animals – a review. Annals of Animal Science 17, 337–350.

11. Zieba D.A., **Kirsz K.**, Szczesna M., Molik E., Romanowicz K., Misztal T., 2015, Photoperiod influences the effects of ghrelin and serotonin receptor agonist on growth hormone and prolactin secretion in sheep. J Neurol Neurophysiol 6:4.

12. Szczesna M., **Kirsz K.,** Kmiotek M., D.A. Zieba D.A., 2015, Seasonal fluctuations in the steady-state mRNA levels of suppressor of cytokine signaling-3 (SOCS-3) in the mammary gland of lactating and non-lactating ewes. Small Ruminant Research. 124: 101–104.

13. **Kirsz** K., Szczesna M., Dudek K., Bartlewski P.M., Zieba D.A., 2014, Influence of season and nutritional status on the direct effects of leptin, orexin-A, and ghrelin on luteinizing hormone and growth hormone secretion in the ovine pituitary explant model. Domest Anim Endocrinol. 48: 69-76.

14. Szczesna M., **Kirsz K.**, Kucharski M., Szymaszek P., Zieba D.A., 2013, Obesity and leptin resistance: the role of growth hormone. Health. 5 (8A3), 29-39.

15. **Kirsz K.**, Szczęsna M., Molik E., Misztal T., Wojtowicz A., Zieba D.A., 2012, Seasonal changes in the interactions between leptin, ghrelin and orexin in sheep. J. Anim. Sci. 90(8):2524-31.

16. Zieba D.A., **Kirsz K.**, Molik E., Romanowicz K., Wojtowicz A.K., 2011, Effects of orexigenic peptides and leptin on melatonin secretion during different photoperiods in seasonal breeding ewes: an in vitro study. Domest. Anim. Endocrinol. 40 (3):139-46.

17. **Kirsz K.**, Zieba D.A., 2012, A review on the effects of photoperiod and melatonin on the interactions between ghrelin and serotonin. Gen. Comp. Endocrinol. 5;179 (2):248-253.

18. **Kirsz K.,** Zieba D.A., 2012, The discovery of neuromedin U and its pivotal role in the central regulation of energy homeostasis. Adv. Hyg. Exp. Med. 66 196-203.

19. **Kirsz K.,** Zieba D.A., 2012, Selected hypothalamic factors integrating reproduction and energy balance control in animals. Veterinary Medicine – Science and Practice. 68 (1).

20. **Kirsz K**., Zieba D.A., 2011, Ghrelin-mediated appetite regulation in the central nervous system. Peptides. 32(9), 2256-2264.