

**Prof. dr hab. Dorota Zięba-Przybylska**



**University of Agriculture in Krakow**

**Faculty of Animal Sciences, Department of Nutrition, Animal Biotechnology and Fisheries**

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**Consultation hours:** via email

**Research interest:**

Neuroendocrine mechanisms responsible for occurrence seasonal leptin resistance upon sheep hypothalamus mainly arcuate nuclei. Daily and annual changes in metabolic and reproductive processes in sheep. The studies are analysed relationships between anorexigenic system (resistin, leptin) 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). The role of peptides engaged in appetite control in reproductive and metabolic processes – model female ovariectomized sheep or tissue explants.

**Research experience:**

**SCIENTIFIC COMMITTEE RESEARCH GRANTS:**

1. “ The role of steroids hormones of corpus luteum in the regulation of follicular growth of high fecundity Olkuska sheep” Polish Scientific Committee 5 PO6D 017 14 **PI (1997-1999)**
2. “The role of placental lactogen (pL) in pregnancy maintaining in high fecundity Olkuska sheep” Polish Scientific Committee 5 PO6D 009 15 **PI (1998-2000)**
3. “The role of photoperiod in the regulation of hypothalamus sensitivity to leptin concentration in sheep” High Education Ministry project 2PO6D 003 29 **PI (2005-2008)**
4. The modulation of biological rhythms of seasonality and lactation profile in sheep. Contractor ” Polish Scientific Committee N N311 245033 MNiSW **PI (2007-2010)**.
5. The involvement of thyroid’s hormones and leptin in seasonal reproduction in sheep. High Education Ministry project N311 085634 **PI (2008-2010)**
6. The effect of photo period on interactions between leptin, prolactin and growth hormone in non-lactating sheep” Polish Scientific Committee N311 097649 **PI (2009-2011)**
7. “Determination of interactions between leptin and key-peptides engaged in energy homeostasis in sheep”, Polish National Research Council No N N311 318436 **PI (2009-2011)**
8. The role of serotonin in the regulation of melatonin release under the influence of ghrelin in sheep”

Polish National Research Council No 2012/05/B/N/NZ4/02408 **PI (2013-2015)**

9. "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)**
10. The determination of factors engaged in leptin passing through blood-brain barrier and phenomenon of leptin resistance" a grant from the Polish National Research Council No. OPUS 2015/19/B//NZ9/01314 **PI (2015-2019)**

#### **SOME OF THE TRAINING AND COURSES:**

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| January – July 1996  | University of British Columbia, Department of Animal Science Laboratory of Prof. R. Rajamahendran, Vancouver, Canada  |
| January - 1996   | Lentiviral Biosafety Course, University of British Columbia, Vancouver.   |
| February 1999  | Course „Cell cultures to Tissue engineering” Department of Anatomy University of Regensburg, Regensburg, Germany, Laboratorium Prof. Will W. Minuth   |
| September - 1999   | <b>Course</b> dr Milan Tomanek Research Institute of Animal Production, Department of Biology of Reproduction, Praha, Czech Republic  |
| 2001-2003  | <b>Post-doc position Texas A&amp;M University, Texas, USA</b> Postdoctoral Research Associate, Animal Reproduction Laboratory of Prof. Gary L. Williams, Texas A&M University, Agricultural Research Station, Beeville, Department of Animal Science and Center for Animal Biotechnology and Genomics, Texas A&M University, College Station <b>2-letni 2001-2003 r</b> |
| June- 2004   | <b>Course:</b> 7th Budapest Workshop of Young Endocrinologists: Regulatory Proteins in Metabolism and Reproduction (ENDO-2004, Budapest, Hungary  |
| September - 2011   | <b>Course:</b> Neuroendocrine regulation of seasonality in sheep, International Meeting for Evolution of Reproductive Biology and task of Frontiers: Trajectory and Prospects of IVF, Stem Cell and Epigenetic Studies & Japan-Poland Joint Seminar "Cutting-edge   |
| May- 2013  | <b>Course:</b> "The use of Focused Nutrition, Environmental and Socio-Sexual Factors for the Modulation of Reproductive Performance", Łańsk, Poland   |
| June - 2017  | <b>Sabbatical:</b> The Hebrew University of Jerusalem, The Robert H. Smith Faculty of Agriculture, Food and Environment, laboratory of prof. Arieh Gertler  |
| Training in the field of molecular biology methods such as | <b>Real-Time PCR, Western-blot and ELISA</b>  |

#### **Visiting Scholar:**

1. Faculty of Land and Food Systems, University of British Columbia, Vancouver, Canada. Position: **recipient of the Dekaban Foundation Scholarship**, working on project: "The effect of molybdenum on

reproductive performance in cattle (January – July 2013)

2. Texas A&M University, Agriculture and Life Sciences, Department of Animal Science, Physiology of Reproduction Section. Position: **post-doc**, working on project: "Investigation of the effects of leptin of reproduction in beef cattle"(September 2001-August 2003).
3. The Hebrew University of Jerusalem, The Robert H. Smith Faculty of Agriculture, Food and Environment, laboratory of prof. Arieh Gertler: **sabbatical**, working on project: "The large scale of preparation of human and sheep recombinant resistin" (June 2017)
- 4.

#### **Education:**

##### **1987-1991**

B.S., Animal Physiology, major: Culture of cell and tissue in vitro, Jagiellonian University, Krakow, Poland

##### **1991-1992**

1-year laboratory training, Oncology Clinic, Collegium Medicum, Jagiellonian University, Krakow, Poland

##### **1991- 1992**

M.Sc., Animal Physiology (Tissue culture minor) Jagiellonian University, Krakow, Poland

##### **1996**

Scholarship Dr and Ms Dekaban Foundation, University of British Columbia, Department of Animal Science, Vancouver, Canada, Laboratory of Prof. R. Rajamahendran.

##### **1997**

Ph.D., Animal Reproductive Physiology, University of Agriculture, Krakow, Poland

##### **1999**

##### **Training Course**

1-month "Cell cultures to Tissue engineering", Department of Anatomy University of Regensburg, Germany Prof. Will W. Minuth

##### **2001-2003**

##### **Texas A&M University, Texas, USA**

Postdoctoral Research Associate Animal Reproduction Laboratory of Prof. Gary L. Williams, Texas A&M University Agricultural Research Station, Beeville, Department of Animal Science and Center for Animal Biotechnology and Genomics, Texas A&M University, College Station, USA

##### **2006**

Associate Professor Recognition, Animal Reproduction, Agricultural University in Krakow, Poland

##### **2007-2009**

Head of Department of Swine and Small Ruminant Breeding, Faculty of Animal Science, Agricultural University in Krakow, Poland

##### **2011-2013**

Acting manager of University Center of Veterinary Medicine JU- AU (of Jagiellonian University and Agricultural University) and Tissues Culture the Faculty of Animal Sciences, Agricultural University in Krakow (2001-2006)

##### **2012**

Professor recognition in biology

##### **2013-2018**

Head of Department Animal Biotechnology, Faculty of Animal Science, Agricultural University in Krakow, Poland

#### **Professional profiles:**

ORCID: <http://orcid.org/...>

Research ID: <http://www.researcherid.com/rid/...>

Mendeley: <https://www.mendeley.com/profiles/...>

Research Gate: <https://www.researchgate.net/profile/...>

Google Scholar: <http://scholar.google.com/citations...>

#### List of most latest publications:

1. E. Honkisz, D. **Zieba-Przybylska**, Wojtowicz AK. The effect of triclosan on hormone secretion and viability of human choriocarcinoma JEG-3 cells. *Reprod Toxicol*. 2012; 34: 385-392.
2. K. Kirsz, **D.A. Zieba**. A review on the effect of the photoperiod and melatonin on interactions between ghrelin and serotonin. *Gen. Comp. Endocrinol*. 2012;179(2): 248-253.
3. Kirsz K., M. Szczesna, E. Molik, T. Misztal, A. K. Wojtowicz, **D. A. Zieba**. Seasonal changes in the interactions between leptin, ghrelin and orexin in sheep. *J. Anim. Sci*. 2012; 90: 2524-2531
4. Szóstek A.Z., M.J. Siemieniuch, A.M. Galvão, K. Lukasik, **D. Zieba**, G.M. Ferreira-Dias, D.J. Skarzynski. Effects of cell storage and passage on basal andoxytocin-regulated prostaglandin secretion by equine endometrial epithelial and stromal cells. *Theriogenology*, 2012; 77: 1698-1708.
5. Szczesna M., K. Kirsz, M. Kucharski, P. Szymaszek and **Zieba D.A.**. The seasonal interactions between leptin and GH and its effect on pituitary SOCS-3 gene expression in sheep. *Health*. 2013; 5 (8A3): 29-39 DOI: [10.4236/health.2013.58A3005](https://doi.org/10.4236/health.2013.58A3005)
6. Molik E., T. Misztal, K. Romanowicz, **Zieba D.A.** Short-day and melatonin effects on milking parameters, prolactin profiles and growth-hormone secretion in lactating sheep. *Small Rumin. Res*. 2013; 109 ( 2-3):182-187 DOI: 10.1016/j.smallrumres.2012.10.006.
7. E. Molik, M. Paternak, M. Błasiak, T. Misztal, K. Romanowicz, **D.A. Zieba**. The effect of the diversified signal of melatonin on milk yields in seasonally breeding sheep. *Arch Tierzucht* 2013; 56: 93-100.
8. K. Kirsz, M Szczesna K. Dudek, P. Bartlewski and **D A Zieba**. The 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 explants model. *Domest. Anim. Endocrinol*. 2014; 48: 69-76.
9. Murawski M., Schwarz T., Grygier J., Patkowski K., Oszczeda Z., Jelkin I., Kosiek A., Gruszecki T.M., Szymanowska A., Skrzypek T., **Zieba D.A.** and Bartlewski P.M. The utility of nanowater for ram semen cryopreservation. *Exp. Biol.Med. (Maywood)* 2015; 240: 576–584. DOI: [10.1177/1535370214560971](https://doi.org/10.1177/1535370214560971)
10. Vanduzer T., Duggavathi R., Murawski M., **Zieba D.A.**, Sroka P., Bartlewski P. Correlations among antral follicular echotexture, apoptosis and expression of key steroidogenic enzymes in sheep. *J. Reprod. Dev*. 2014; 60(6): 476-482 (15%) M
11. Molik E, Błasiak M, Misztal T, Romanowicz R., **Zięba-Przybylska D**. Effect of orexin A on prolactin secretion in lambs born under different photoperiod conditions - in vitro study. 2013;60(1): 34-38. *Czech. J. Anim. Sci*. 2015; 60(1): 33–37
12. Warren L., Murawski M., Wilk K., **Zieba D.A.**, Bartlewski P.M. Suitability of antral follicle counts and computer-assisted analysis of ultrasonographic and magnetic resonance images for estimating follicular reserve in porcine, ovine and bovine ovaries *ex situ*. *Exp. Bio. Med.*; 2015; 240: 576–584. DOI:[10.1177/1535370214560971\\_0\\_1-9\\_0971](https://doi.org/10.1177/1535370214560971_0_1-9_0971)
13. Szczesna M., Kirsz K., Kmiotek M., **Zięba D.A.** 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 Rumin. Res*. 2015;124: 101-104 doi:2015 [10.1016/j.smallrumres.2015.01.012](https://doi.org/10.1016/j.smallrumres.2015.01.012)
14. Szczesna M, **D.A. Zięba**. Phenomenon of leptin resistance in seasonal animals: the failure of leptin action in the brain. *Domest. Anim. Endocrinol*. 2015; 52:60-70. DOI: [http://dx.doi.org/10.1016/j.domaniend2015.03.002](https://doi.org/http://dx.doi.org/10.1016/j.domaniend2015.03.002)
15. Bartlewski PM, Seaton P., Szpila P., Oliveira M.E.F., Murawski M., Schwarz T., R.T Kridli, **D.A. Zieba**. Comparison of the effects of pre-treatment with Veramix® sponge (medroxyprogesterone acetate) or CIDR® (natural progesterone) in combination with an injection of estradiol-17β on ovarian activity, endocrine profiles and embryo yields in cyclic ewes superovulated in the multiple-dose Folltropin®-V. *Theriogenology* 2015; 84:1225-1237. DOI:[10.1016/j.theriogenology.2015.07.002](https://doi.org/10.1016/j.theriogenology.2015.07.002)

16. **Zieba DA**, Kirsz K, Szczesna M, Molik E, Romanowicz K, Misztal T. Photoperiod influences the effects of ghrelin and serotonin receptor agonist on growth hormone and prolactin secretion in sheep. *J. Neurol. Neurophysiol.* 2015; 6: 301. doi:10.4172/2155-9562.1000301.
17. Nosal P., Murawski M., Bartlewski P.M., Kowal J., Skalska M., **Zięba D.A.** Assessing the usefulness of mineral licks containing herbal extracts with anti-parasitic properties for the control of gastrointestinal helminths in grazing sheep – a field trial. *Helminthologia* 2016; 53(2):180–185. DOI:10.1515/helmin-2016-0008
18. Bartlewski PM, Seaton P., Szpila P., Oliveira M.E.F., Murawski M., Schwarz T., R.T Kridli, **D.A. Zieba.** Is progesterone the key regulatory factor behind ovulation rate in sheep? *Domest. Anim. Endocrinol.* 2016; 52:60-70. DOI: <http://dx.doi.org/10.1016/j.domaniend.2015.03.002>
19. Kaczor U., Poltowicz K., Kucharski M., Sitarz A. M., Nowak J., Wojtysiak D., **Zieba D. A.** Effect of ghrelin and leptin receptors genes polymorphisms on production results and physicochemical characteristics of *M. pectoralis superficialis* in broiler chickens. *Anim. Prod. Sci.*; 2017; 57:42-50, <http://dx.doi.org/10.1071/AN15152>
20. Kirsz K., Szczesna M., Molik E., Misztal T., **Zieba D.A.** Induction of LH and GH secretion by orexin A and ghrelin is controlled in vivo by leptin and photoperiod in sheep. *Ann. Anim. Sci.*; 2017; 1:155–168, DOI: 10.1515/aoas-2016-0041
21. Kirsz K., Szczesna M., Borsuk A., **Zięba D.A.** Cross-talk between leptin, ghrelin and orexins in the central nervous system of seasonal animals – a review. *Ann. Anim. Sci.* 2017;17:155-168: <https://doi.org/10.1515/aoas-2016-0070>
22. Kania B., Wrońska D., **Zięba D.** Introduction to neural plasticity mechanism. *J. Beh. Brain Sci.* 2017; 7:41-49. <https://doi.org/10.4236/jbbs.2017.72005> M
23. Molik E., Błasiak M., Misztal T., Romanowicz K., **Zięba D.A.** Profile of gonadotropic hormone secretion in sheep with disturbed rhythm of seasonality. *Czech J. Anim. Sci.* 2017; 62(6): 242-248 DOI: 10.17221/22/2016-CJAS
24. Kania B., Wrońska D., **Zięba D.** Central glutamatergic-purinergetic system importance in brain. *Neural Plasticity* Special Issue. 2017. 07(07):259-272 DOI: 10.4236/jbbs.2017.77019
25. Kania B., Wrońska D., **Zięba D.** Central Glutamatergic-Purinergetic System Importance in Brain/ Neural Plasticity Special Issue: “Brain and Neurons”, *J. Behav. Brain Sci.*, Scientific Research Pub., 7,(7):259-272, DOI:10.4236/jbbs.2017.77019
26. Kirsz K., Szczesna M., Molik E., **Zięba D.A.** Effects of ghrelin on nocturnal melatonin secretion in sheep: An in vitro and in vivo approach. *J. Anim. Sci.* 2017;95:4101–4112. doi:10.2527/jas2017.17372017.
27. Szczesna M., Kirsz K., Misztal T., Molik E., **Zieba D.A.** 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.* 2018;96:3348-3357. <https://doi.org/10.1093/jas/sky203>
28. Biernat W., Szczesna M., Kirsz K., **Zieba D.A.** Resistin regulates reproductive hormone secretion from the ovine adenohypophysis depending on season. *Domest. Anim. Endocrinol.* 2018;65:95-100, [10.1016/j.domaniend.2018.07.001](https://doi.org/10.1016/j.domaniend.2018.07.001)
29. Szczesna M., Kirsz K., Misztal T., **Zieba D.A.** Downregulation of LRB and upregulation of SOCS-3 during pregnancy in sheep - implications for leptin resistance 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.* 2019;274:73-79 (20%) doi: 10.1016/j.ygcen.2019.01.003
30. Kirsz K., Szczesna M., Bocheńska A., Pietsch-Fulbiszewska A., Sowińska N., Kabała N, **Zięba D.A.** Effects of central orexin A on gonadotropins and progesterone secretion in ewes during the luteal phase of the estrous cycle and during anestrus. *Small Rumin. Res.* 2019;177: 82-88 (10%) doi: 10.1016/j.smallrumres.2019.06.021.
31. Krawczyńska A., Antushevich H., Bochenek J., Wojtulewicz K., Pawlina B., Herman A.P. and **D.A. Zięba.** Photoperiodic conditions as a factor modulating leptin influence on pro-inflammatory cytokines and their receptors gene expression in ewe's aorta. *J. Anim. Feed Sci.* 2019;28 (2): 128-137. [doi.org/10.22358/jafs/110022/2019](https://doi.org/10.22358/jafs/110022/2019).
32. **Zieba D.A.**, Biernat W., Szczesna M., Kirsz K., Misztal M. Hypothalamic-pituitary and adipose tissue responses to the effect of resistin in sheep: integration of leptin and resistin signaling involving suppressor of cytokine signaling 3 and the long form of the leptin receptor. *Nutrients* 2019;11,2180; doi:10.3390/nu11092180.
33. **Zięba D.A.** Factors affecting the transfer of leptin through blood-brain barrier (BBB). The implication for leptin resistance. *Appro. Poult. Dairy & Vet. Sci.* 2019; 6 (5):595-598. doi: 10.31031/APDV.2019.06.000648
34. Krawczyńska A., Herman A.P., Antushevich H., Bochenek J., Wojtulewicz K., Pawlina B. and **Zieba D.** The influence of photoperiod on the action of exogenous leptin on gene expression of pro-inflammatory cytokines and their receptors in the thoracic perivascular adipose tissue (PVAT) in ewes. *Med Infl*, 2019, 7129476:12, <https://doi.org/10.1155/2019/7129476>.

35. Szczesna M., Kirsz K., Misztal T., **Zieba D.A.** Pregnancy-induced changes in the transcript levels of prolactin receptor and its suppressor in the ovine hypothalamus and adenohypophysis. *Reprod. Domest Anim.* 2019;0:1-8 <https://doi.org/10.1111/rda.13576>
36. Kirsz, K., Szczesna, M., Biernat, W., Molik, E., **Zięba, D.A.**, Involvement of orexin A in nocturnal melatonin secretion into the cerebrospinal fluid and the blood plasma in seasonal sheep, *Gen. Comp. Endocrinol.*, 2020; 286, 113304: 1-9. <https://doi.org/10.1016/j.ygcen.2019.11330>
37. Szczesna M., Kirsz K., Nowakowski M, **D. A. Zięba.** Transcript abundance of the prolactin receptor, leptin receptor and their major suppressor in mammary glands of sheep during pregnancy and lactation. *Ann. Anim. Sci.* 2020 in press
38. **Zięba D.A.**, Biernat. W. Barć J. Roles of leptin and resistin in metabolism, reproduction and leptin resistance. *Domest. Anim. Endocrinol.* 2020;73:xxx-xxx
39. Kirsz K., **Zięba D.A.** The discovery of neuromedin U and its pivotal role in the central regulation of energy homeostasis. *Postepy Hig. Med. Dosw.* 2012; 66: 196-203
40. Borsuk A., Biernat W., **Zięba D.A.** Kontrowersyjna rola rezystyny. Wielokierunkowość działania w organizmie. *Postepy Hig. Med. Dosw.* 2018; 72:327-337 [10.5604/01.3001.0011.8252](https://doi.org/10.5604/01.3001.0011.8252)

Chapter in books:

41. Szczesna M., **Zięba D.** Role of Leptin in the Reproduction and Metabolism: Focus on Regulation by Seasonality in Animals, [w]: Update on mechanisms of hormone action – focus on metabolism, growth and reproductions, red. G. Aimaretti, P. Marzullo, F. Prodham, InTech Rijeka Chorwacja 2012, 233-258. ISBN 978-953-307-341-5.M
42. Molik E., G. Bonczar, T. Misztal, A. Żebrowska and **Zięba D.A.** The Effect of Photoperiod and Exogenous Melatonin on the Protein Milk Content in Sheep Milk. [w]: Milk Protein, (ISBN 978-953-51-0743-9), edited by W.L. Hurley, InTech, 2012:325-340.
43. Molik E., T. Misztal, **Zięba D.A.** The Effect of Physiological and Environmental Factors on the Prolactin Profile in Seasonally Breeding Animals.[w]: Prolactin, (ISBN 978-953-51-0943-3), edited by G. M. Nagy, B. E. Toth. InTech, 2013:121-139.
44. Molik E., **Zięba-Przybylska D.A.** Role of Melatonin and the Biological Clock in Regulating Lactation in Seasonal Sheep.[w]: Lactation, (ISBN 978-953-51-3137-3), edited by I. Gigli. InTech, 2017:21-39.
45. **Zięba DA**, Molik E. Agroecology. Animal Husbandry. Biology of small ruminants in relation to the environmental adaptation. 2014 (7)97-98. Wydawnictwo Uniwersytetu Rolniczego. ISBN 978-83-64758-06-5.
46. Molik E, **Zięba DA.** Agroecology. Animal Husbandry. Sheep as a part of different types of ecological systems. 2014 (7)96-997. Wydawnictwo Uniwersytetu Rolniczego. ISBN 978-83-64758-06-5.