

JRD Vol. 70 (5) の発刊のお知らせ

SRD 会員の皆様へ

平素から The Journal of Reproduction and Development (JRD) の刊行にご協力を頂き有難うございます。Vol. 70 (5) が発刊となりました。本号では 11 報の論文を寄稿していただきました。ご一読いただき、論文執筆の際にご活用いただけますようお願いいたします。

JRD 編集委員長 原山 洋

JRD Vol. 70 (5)

https://www.jstage.jst.go.jp/browse/jrd/70/5/_contents/-char/en

Original Article

Dairy cow parity affects relationships among nutritional parameters in the blood of dams, umbilical cords, and calves and placental development at calving

Riku MASHIMO, Hanon OHBAN, Yuka KUMAZAKI, Sayaka ITO, Tomono KATAGIRI, Nobuyuki KUSABA, Chiho KAWASHIMA

Volume 70, Issue 5, Pages 264-271

DOI <https://doi.org/10.1262/jrd.2024-010>

Association between parturition vaginal temperature changes and placenta expulsion time in Holstein dairy cattle

Miki SAKATANI, Kaiyu KUBOTA, Satoshi HAGA, Masafumi MIWA

Volume 70, Issue 5, Pages 272-278

DOI <https://doi.org/10.1262/jrd.2024-012>

Carnosine supplementation in cryopreservation solution improved frozen-thawed bovine embryo viability

Toshimichi ISHII, Kento MORI-KOBAYASHI, Sho NAKAMURA, Satoshi OHKURA, Shuichi MATSUYAMA

Volume 70, Issue 5, Pages 279-285

DOI <https://doi.org/10.1262/jrd.2023-071>

Autophagy in the corpus luteum correlates with tissue growth in pregnant rats

Yasuaki OISHI, Koji ASAKAWA, Yuri ISHIWATA, Shota OKA, Ryota TERASHIMA, Makoto SUGIYAMA, Keiichiro KIZAKI, Mitsumori KAWAMINAMI, Shiro KURUSU

Volume 70, Issue 5, Pages 286-295

DOI <https://doi.org/10.1262/jrd.2024-019>

Cover Story:

The temporally regulated function and structure of the corpus luteum (CL) are critical for the establishment, maintenance, and termination of pregnancy across various animal species. Oishi *et al.* found that autophagic activity in the rat CL fluctuates in correlation with tissue weight rather than progesterone (P4) production (Oishi *et al.*, Autophagy in the corpus luteum correlates with tissue growth in pregnant rats. pp. 286–295). Their perturbation

experiment using a chemical inhibitor suggests that autophagy contributes to increasing the size of luteal steroidogenic cells and precisely modulates their P4 secretion. The dual nature of autophagy, which controls cellular survival or death, may be implicated in the reciprocal regulation of luteal P4 secretion to determine the appropriate gestational length in species whose P4 production depends solely on CL.

Perilipin2 depletion causes lipid droplet enlargement in the ovarian corpus luteum in mice

Megumi IBAYASHI, Takayuki TATSUMI, Satoshi TSUKAMOTO

Volume 70, Issue 5, Pages 296-302

DOI <https://doi.org/10.1262/jrd.2024-023>

A polysaccharide gel made of gellan gum improves oocyte maturation and embryonic development in pigs

Shunsuke HARA, Koumei SHIRASUNA, Hisataka IWATA

Volume 70, Issue 5, Pages 303-308

DOI <https://doi.org/10.1262/jrd.2024-017>

Cpne1 deficiency preserves sperm motility under Ca²⁺ channel blockade

Qiang XIE, Hanbin ZHANG, Yuge ZHUANG, Jinsheng LIU, Zicong HUANG, Xiaoyuan ZHANG, Ke MA, Wenyuan LIU, Minyu XIE, Chuyu HUANG, Xiaojing ZHONG, Feilong CHEN, Feng ZOU, Wansong ZHANG, Chunming QIU, Canbiao SUN, Xiangjin KANG, Zhenguo CHEN, Guofei ZHANG

Volume 70, Issue 5, Pages 309-319

DOI <https://doi.org/10.1262/jrd.2024-027>

Kdm4d mutant mice show impaired sperm motility and subfertility

Zhuoran XU, Yuka FUJIMOTO, Mizuki SAKAMOTO, Daiyu ITO, Masahito IKAWA, Takashi ISHIUCHI

Volume 70, Issue 5, Pages 320-326

DOI <https://doi.org/10.1262/jrd.2024-039>

Central δ/κ opioid receptor signaling pathways mediate chronic and/or acute suckling-induced LH suppression in rats during late lactation

Yoshihisa UENOYAMA, Miku NONOGAKI, Hitomi TSUCHIDA, Marina TAKIZAWA, Sena MATSUZAKI, Naoko INOUE, Hiroko TSUKAMURA

Volume 70, Issue 5, Pages 327-337

DOI <https://doi.org/10.1262/jrd.2024-045>

Technology Report

Zinc transporter *ZnT3/Slc30a3* has a potential role in zinc ion influx in mouse oocytes

Atsuko KAGEYAMA, Jumpei TERAOKAWA, Shunsuke TAKARABE, Hibiki SUGITA, Yui KAWATA, Junya ITO, Naomi KASHIWAZAKI

Volume 70, Issue 5, Pages 338-342

DOI <https://doi.org/10.1262/jrd.2024-044>

Three-dimensional cell culture using CD9-positive cells isolated from marginal cell layer of intermediate lobe of rats sustains *in vivo*-like primary niche environment

Kotaro Horiguchi, Takehiro Tsukada, Saishu Yoshida, Ken Fujiwara, Takashi Nakakura, Morio Azuma, Ayano Shindo, Rumi Hasegawa, Shu Takigami

Volume 70, Issue 5, Pages 343-347

DOI <https://doi.org/10.1262/jrd.2024-033>

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https://www.jstage.jst.go.jp/browse/jrd/70/4/_contents/-char/en

SRD Young Investigator Award 2023

Molecular approaches to mammalian uterine receptivity for conceptus implantation

Kaiyu Kubota

Volume 70 Issue 4 Pages 207-212

DOI <https://doi.org/10.1262/jrd.2024-022>

Cover Story:

Uterine receptivity is the specific state during early pregnancy when the endometrium is ready to accept the embryo or conceptus, and this process by which the embryo attaches to the endometrium is also known as implantation. Kubota summarized the molecular mechanisms underlying steroid hormone-induced uterine receptivity and the similarities and differences in this mechanism among different mammals (Kubota K. Molecular approaches to mammalian uterine receptivity for conceptus implantation, pp. 207–212). This review will help understand the importance of uterine receptivity and the challenges associated with alleviating implantation failure. Investigating the mechanism of uterine receptivity is necessary to develop diagnostic and therapeutic tools for successful pregnancies.

Original Article

Alpha-synuclein expression in oxytocin neurons of young and old bovine brains

Yvan Bienvenu Niyonzima, Yuuki Asato, Hiroya Kadokawa

Volume 70 Issue 4 Pages 213-222

DOI <https://doi.org/10.1262/jrd.2024-020>

Excluding alanine from minimum essential medium (MEM) nonessential amino acid supplementation of the culture medium facilitates post-fertilization events and early cleavages of bovine oocytes fertilized *in vitro*

Nobuhiko Itami, Satoshi Akagi, Yuji Hiraio

Volume 70 Issue 4 Pages 223-228

DOI <https://doi.org/10.1262/jrd.2023-098>

Oocyte activation with *phospholipase C* mRNA induces repetitive intracellular Ca²⁺ rises and improves the quality of pig embryos after intracytoplasmic sperm injection

Michiko NAKAI, Shun-ichi SUZUKI, Dai-ichiro FUCHIMOTO, Shoichiro SEMBON, Kazuhiro KIKUCHI

Volume 70 Issue 4 Pages 229-237

DOI <https://doi.org/10.1262/jrd.2023-105>

Role and action mechanisms of tPA in CRH-induced apoptosis of mouse oviductal epithelial and mural granulosa cells

Yong-Qing YANG, Min ZHANG, Qi HUA, Rui-Jie MA, Xiao-Yan WANG, Hong-Jie YUAN, Ming-Jiu LUO, Jing-He TAN

Volume 70 Issue 4 Pages 238-246

DOI <https://doi.org/10.1262/jrd.2024-028>

Resveratrol intake by males increased the mitochondrial DNA copy number and telomere length of blastocysts derived from aged mice

Noko TERAMOTO, Yuri OKADA, Nao ABURADA, Masamune HAYASHI, Jun ITO, Komei SHIRASUNA, Hisataka IWATA

Volume 70 Issue 4 Pages 247-253

DOI <https://doi.org/10.1262/jrd.2024-043>

Technology Report

Lower developmental potential of rat zygotes produced by ooplasmic injection of testicular spermatozoa versus cauda epididymal spermatozoa

Misuzu IDE, Ibuki SAITO, Makoto SANBO, Mito KANATSU-SHINOHARA, Takashi SHINOHARA, Masumi HIRABAYASHI, Shinichi HOCHI

Volume 70 Issue 4 Pages 254-258

DOI <https://doi.org/10.1262/jrd.2024-030>

Evaluation of bovine embryo quality based on gene expression profiling using whole-transcriptome amplification

Takashi FUJII, Takamasa MUKAI, Shoji HASEGAWA, Toh-ichi HIRATA, Ken SAWAI

Volume 70 Issue 4 Pages 259-263

DOI <https://doi.org/10.1262/jrd.2024-007>

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SRD Outstanding Research Award 2023

Role of chemokines in regulating luteal and uterine functions in pregnant cows

Ryosuke SAKUMOTO

Volume 70 Issue 3 Pages 145-151

DOI <https://doi.org/10.1262/jrd.2023-100>

Cover Story:

Chemokines are known to regulate various reproductive functions, such as regulation of corpus luteum (CL) and uterine functions in cows. However, the role of chemokines in pregnancy has not yet been fully elucidated. Sakumoto summarized and reviewed the literature on chemokine (-receptor) expression and its physiological roles in the bovine CL and uterus during pregnancy. This review will help understand the mechanisms of chemokine-mediated interactions among the CL, uterus, immune cells, and conceptus during pregnancy in cows.

SRD Young Investigator Award 2023

Chromatin structure in totipotent mouse early preimplantation embryos

Masatoshi OOGA

Volume 70 Issue 3 Pages 152-159

DOI <https://doi.org/10.1262/jrd.2023-106>

Original Article

Effect of ovarian stimulation on developmental speed of preimplantation embryo in a mouse model

Mayuko KURUMIZAKA, Tatsuma YAO, Mikiko TOKORO, Noritaka FUKUNAGA, Yoshimasa ASADA, Kazuo YAMAGATA

Volume 70 Issue 3 Pages 160-168

DOI <https://doi.org/10.1262/jrd.2023-089>

Lipopolysaccharide-binding protein in follicular fluid is associated with the follicular inflammatory status and granulosa cell steroidogenesis in dairy cows

Fumie MAGATA, Misato KIKUZAWA, Heinrich BOLLWEIN, Fuko MATSUDA, Shingo HANEDA

2024 Volume 70 Issue 3 Pages 169-176

DOI <https://doi.org/10.1262/jrd.2023-104>

Social effects on behaviorally-scored and pedometer-detected estrus in beef cattle

Hiroimi KUSAKA, Minoru SAKAGUCHI

Volume 70 Issue 3 Pages 177-183

DOI <https://doi.org/10.1262/jrd.2024-005>

Physiological high temperatures alter the amino acid metabolism of bovine early antral follicles

Kohei KAWANO, Kenichiro SAKAGUCHI, Nattapong NINPETCH, Yojiro YANAGAWA, Seiji KATAGIR

Volume 70 Issue 3 Pages 184-191

DOI <https://doi.org/10.1262/jrd.2023-096>

Changes in interleukin-2, -4, -6 and -8 expression in the postovulatory sow endometrium after artificial insemination based on conceived or failed to conceive

Minami W. OKUYAMA, Masaharu MORIYOSHI, Seiji KATAGIRI

Volume 70 Issue 3 Pages 192-196

DOI <https://doi.org/10.1262/jrd.2023-094>

DNA repair is efficient in irradiated M phase zygotes

Yuan WANG, Dai TSUKIOKA, Shoji ODA, Hiroshi MITANI, Fugaku AOKI

Volume 70 Issue 3 Pages 197-201

DOI <https://doi.org/10.1262/jrd.2024-018>

Technology Report

Effect of globin peptide on female fertility in aging granulosa cell-specific *Nrg1* knockout mice

Takashi UMEHARA, Marino OGASAHARA, D.M.V. Supun PREMARATHNE, Yuka SASAKAWA, Yasuo SUMIDA, Masayuki SHIMADA

Volume 70 Issue 3 Pages 202-206

DOI <https://doi.org/10.1262/jrd.2023-076>

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Obituary (Special thanks)

In memory of Dr. Ryuzo Yanagimachi (Yana) (1928–2023)

Teruhiko WAKAYAMA, Atsuo OGURA

Volume 70 Issue 2 Pages i-iv

DOI <https://doi.org/10.1262/jrd.2024-E01>

Original Article

Identification and characterization of dystrophin-locus-derived testis-specific protein: A testis-specific gene within the intronic region of the rat dystrophin gene

Keitaro YAMANOUCI, Shizuka KATO, Yukie TANAKA, Masanari IKEDA, Yukina OSHIMO, Takanori SHIGA, Kei HATAMOTO, James CHAMBERS, Takuya IMAMURA, Ryuji HIRAMATSU, Kazuyuki UCHIDA, Fuko MATSUDA, Takashi MATSUWAKI, Tetsuya KOHSAKA

Volume 70 Issue 2 Pages 55-64

DOI <https://doi.org/10.1262/jrd.2023-073>

Effect of paternal aging and vitrification on mitochondrial DNA copy number and telomere length of mouse blastocysts

Nao ABURADA, Jun ITO, Yuki INOUE, Taiyo YAMAMOTO, Masamune HAYASHI, Noko TERAMOTO, Yuri

OKADA, Yuichi KOSHIISHI, Koumei SHIRASUNA, Hisataka IWATA

Volume 70 Issue 2 Pages 65-71

DOI <https://doi.org/10.1262/jrd.2023-079>

Lipid droplets synthesized during luteinization are degraded after pregnancy

Junichiro MITSUI, Megumi IBAYASHI, Ryutaro AIZAWA, Tomonori ISHIKAWA, Naoyuki MIYASAKA, Satoshi TSUKAMOTO

Volume 70 Issue 2 Pages 72-81

DOI <https://doi.org/10.1262/jrd.2023-095>

Efficient derivation of embryonic stem cells and primordial germ cell-like cells in cattle

Atsushi SHIRASAWA, Masafumi HAYASHI, Mayumi SHONO, Atsushi IDETA, Takashi YOSHINO, Katsuhiko HAYASHI

Volume 70 Issue 2 Pages 82-95

DOI <https://doi.org/10.1262/jrd.2023-087>

Cover Story:

The process of inducing the germ cell lineage from pluripotent stem cells, referred to as in vitro gametogenesis, aids in comprehending the mechanisms involved in germ cell differentiation and offers an alternative source of gametes for reproduction. Shirasawa et al. have developed a novel method for robust induction of primordial germ cell-like cells (PGCLCs) from newly established bovine embryonic stem (bES) cells. After a 24-hour culture with bone morphogenetic protein 4 (BMP4), followed by a three-dimensional culture with BMP4 and chemicals modulating WNT signaling, bES cells exhibited positive expression for a set of primordial germ cell (PGC) markers, including PRDM1/BLIMP1, TFAP2C, and SOX17. These outcomes are anticipated to have practical implications for the development of stem cell-based reproductive technologies in cattle.

Progesterone and estradiol regulate sperm hyperactivation and in vitro fertilization success in mice

Miyu FUJIKURA, Masakatsu FUJINOKI

Volume 70 Issue 2 Pages 96-103

DOI <https://doi.org/10.1262/jrd.2023-080>

Busulfan administration replicated the characteristics of the epididymal initial segment observed in mice lacking testis-epididymis lumicrine signaling

Daiji KIYOZUMI

Volume 70 Issue 2 Pages 104-114

DOI <https://doi.org/10.1262/jrd.2023-102>

Parallel expression patterns of NR4A nuclear receptor family genes in the pituitary gland of proestrus rats

Ryota TERASHIMA, Daiki NAGAO, Masato IKEO, Keisuke MORIOKA, Titaree LAOHARATCHATHANIN, Shiro KURUSU, Mitsumori KAWAMINAMI

Volume 70 Issue 2 Pages 115-122

DOI <https://doi.org/10.1262/jrd.2023-090>

Time elapsed between ovulation and insemination determines the quality of fertilized rat oocytes

Naomi NAKAGATA, Satoshiro NAKAO, Nobuyuki MIKODA, Katsuma YAMAGA, Toru TAKEO

Volume 70 Issue 2 Pages 123-130

DOI <https://doi.org/10.1262/jrd.2023-067>

High-concentration bovine serum albumin enhances fertilization ability of cold-stored rat sperm
Katsuma YAMAGA, Satohiro NAKAO, Nobuyuki MIKODA, Jorge Mario SZTEIN, Naomi NAKAGATA, Toru TAKEO

Volume 70 Issue 2 Pages 131-137

DOI <https://doi.org/10.1262/jrd.2023-085>

The fertility of dairy heifers and cows is not influenced by the follicular wave of the ovulatory follicle

Javad MOHAMMADI, Mehdi AZARI, Mojtaba KAFI

Volume 70 Issue 2 Pages 138-143

DOI <https://doi.org/10.1262/jrd.2023-084>

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Review

Improvements in in vitro spermatogenesis: oxygen concentration, antioxidants, tissue-form design, and space control
Takehiko OGAWA, Takafumi MATSUMURA, Tatsuma YAO, Hiroshi KIMURA, Kiyoshi HASHIMOTO, Yu ISHIKAWA-YAMAUCHI, Takuya SATO

Volume 70 Issue 1 Pages 1-9

DOI <https://doi.org/10.1262/jrd.2023-093>

Cover Story:

For the past century, achieving in vitro spermatogenesis has remained a difficult challenge for researchers. In 2011, Ogawa et al. successfully demonstrated in vitro spermatogenesis in mice using an organ culture method. However, extending this method to other species posed challenges for over a decade. In 2023, Ogawa's team achieved in vitro spermatogenesis in rats by incorporating several critical modifications to enhance their original technique. This review presents a detailed analysis by Ogawa et al. comparing their method with natural in vivo conditions and other synthetic alternatives. They systematically explore the merits, limitations, and inherent constraints of the organ culture approach, delving into the specifics of medium composition, the principles of the gas-liquid interphase method, use of microfluidic devices, and innovation of the PDMS-ceiling method. Highlighting the challenges faced, including regulating oxygen concentration, managing tissue formation, and regulating culture space-control. The insights and novel concepts shared in this review are particularly valuable for those involved in culture or related disciplines, providing innovative content, and encouraging further exploration in this field.

Original Article

PABPN1L is required for maternal mRNA degradation after meiosis resumption

Chihiro EMORI, Mayo KODANI, Ferheen ABBASI, Masashi MORI, Masahito IKAWA

Volume 70 Issue 1 Pages 10-17

DOI <https://doi.org/10.1262/jrd.2023-077>

Lipid droplet formation is spatiotemporally regulated in oocytes during follicular development in mice

Ryutaro AIZAWA, Megumi IBAYASHI, Junichiro MITSUI, Satoshi TSUKAMOTO

Volume 70 Issue 1 Pages 18-24

DOI <https://doi.org/10.1262/jrd.2023-055>

Development of a fluorometric Cuboni test for the semi-quantitative measurement of urinary estrogen levels and pregnancy detection in mares

Kaede ODA, Maya YOSHIDA, Abdul Razaq IRSHAD, Tomomi KANAZAWA, Toru TAKAHASHI

Volume 70 Issue 1 Pages 25-29

DOI <https://doi.org/10.1262/jrd.2023-083>

Equine chorionic gonadotropin treatment and timed artificial insemination for dairy cow production under heat stress

Daisuke FUNAKOSHI, Hidetoshi SHIOTANI, Makoto SEKI

Volume 70 Issue 1 Pages 30-34

DOI <https://doi.org/10.1262/jrd.2023-069>

Negative photoperiod induces an increase in the number of ovulations in dairy cattle

Fernando LÓPEZ-GATIUS

Volume 70 Issue 1 Pages 35-41

DOI <https://doi.org/10.1262/jrd.2023-075>

Serum-free spontaneously immortalized bovine oviduct epithelial cell conditioned medium promotes the early development of bovine in vitro fertilized embryos

Norikazu MIYASHITA, Satoshi AKAGI, Tamas SOMFAI, Yuji HIRAO

Volume 70 Issue 1 Pages 42-48

DOI <https://doi.org/10.1262/jrd.2023-031>

Technology Report

Capturing temperature changes on the ocular surface along with estrus and ovulation using infrared thermography in Japanese Black cows

Riho OZAKI, Seiji INOUE, Yuki YOROZUI, Rei ICHIKAWA, Naoki YAMADA, Seiya HIGASHI, Shuichi MATSUYAMA, Hiroko TSUKAMURA, Satoshi OHKURA, Yoshihisa UENOYAMA, Yasuhiro MORITA

Volume 70 Issue 1 Pages 49-54

DOI <https://doi.org/10.1262/jrd.2022-116>