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 (6) 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 (6)
https://www.jstage.jst.go.jp/browse/jrd/70/6/_contents/-char/en

Original Article

Preovulatory follicular dynamics and ovulatory events following the use of GnRH 84 h after medroxyprogesterone acetate sponge removal in postpartum buffaloes
Muhammad Usman MEHMOOD, Ghazanfar Ali CHISHTI, Muhammad WASEEM, Burhan e AZAM, Zahid NASEER, Muhammad SAADULLAH, Kehuan LU, Yangqing LU
Volume 70, Issue 6, Pages 349-355
DOI https://doi.org/10.1262/jrd.2024-040

Genome editing of porcine zygotes via lipofection of two guide RNAs using a CRISPR/Cas9 system
Qingyi LIN, Koki TAKEBAYASHI, Nanaka TORIGOE, Bin LIU, Zhao NAMULA, Maki HIRATA, Fuminori TANIHARA, Megumi NAGAHARA, Takeshige OTOI
Volume 70, Issue 6, Pages 356-361
DOI https://doi.org/10.1262/jrd.2024-054

Change in the ability of bovine granulosa cells to elongate transzonal projections and their transcriptome changes during follicle development
Mihoko FUSHII, Hirohisa KYOGOKU, Jibak LEE, Takashi MIYANO
Volume 70, Issue 6, Pages 362-371
DOI https://doi.org/10.1262/jrd.2024-016

MiR-145-5p regulates granulosa cell proliferation by targeting the *SET* gene in KGN cells
Gao LINGLING, Yang QINGXING, Xu JIANBO, Wang WEIJIE, Lu DAN

Volume 70, Issue 6, Pages 372-378
DOI https://doi.org/10.1262/jrd.2024-053

AVPV *Kiss1* neuron-specific knockdown of purinergic P2X2 receptor suppresses LH surge and ovulation in *Kiss1-Cre* rats

Safiullah HAZIM, Shunsuke SEKI, Ryoya YABUSHITA, Mayuko NAGAE, Hitomi TSUCHIDA, Masumi HIRABAYASHI, Yoshihisa UENOYAMA, Hiroko TSUKAMURA, Naoko INOUE

Volume 70, Issue 6, Pages 379-388
DOI https://doi.org/10.1262/jrd.2024-046

Assessment of anti-Müllerian hormone levels as a reproductive indicator in Japanese Black cattle

Takeshi KOYAMA, Hiromi SUZUKI, Miki SHIMIZU, Riuru MIZUNO, Ayaha ISHIGAMI, Nobuyuki KAMIDATE, Yoshihisa OTANI, Michiko OKUBO, Kousaku SOUMA, Hiroki HIRAYAMA

Volume 70, Issue 6, Pages 389-395
DOI https://doi.org/10.1262/jrd.2024-047

Ccdc152 is not necessary for male fertility, but contributes to maintaining sperm morphology

Ryua HARIMA, Takahiro SASAKI, Takayuki KANEKO, Fuka ASO, Hayato TAKASHIMA, Takashi TOYAMA, Kenshiro HARA, Kentaro TANEMURA, Yoshiro SAITO

Volume 70, Issue 6, Pages 396-404
DOI https://doi.org/10.1262/jrd.2024-058

Fertilization and developmental competence of in vitro fertilized embryos from C57BL/6J mice of different ages and the impact of vitrification

Seiji KITO

Volume 70, Issue 6, Pages 405-410
DOI https://doi.org/10.1262/jrd.2024-082

Addition of granulocyte macrophage colony stimulating factor (GM-CSF) during *in vitro* oocyte maturation improves embryo development in a mouse model of advanced maternal age

Anmol SAINI, Nicole O MCPHERSON, Mark B NOTTLE
Volume 70, Issue 6, Pages 411-417
DOI https://doi.org/10.1262/jrd.2024-066
Cover Story:
Study by Saini *et al.* investigated the effects of adding Granulocyte-macrophage colony-stimulating factor (GM-CSF) during *in vitro* maturation (IVM) on oocyte quality in a mouse model of advanced maternal age (Saini *et al.*: Addition of granulocyte macrophage colony stimulating factor (GM-CSF) during *in vitro* oocyte maturation improves embryo development in a mouse model of advanced maternal age. pp. 411–417). Oocytes from older female mice were treated with GM-CSF, and several developmental competence measures were assessed. The treatment tended to increase fertilisation rates (76.19 *vs.* 82.03; $P = 0.07$) while increasing blastocyst rates 51.10 *vs.* 61.52; $P < 0.01$), and the number of good quality of blastocysts (33.31 *vs.* 44.13; $P < 0.05$), along with increased inner cell mass and total cell number. GM-CSF also increased mitochondrial membrane potential. However, it did not affect spindle formation or chromosome alignment. These findings indicate that GM-CSF could improve oocyte quality in women of advanced maternal age by improving embryo development and mitochondrial function.

Technology Report

Serum concentrations of anti-Müllerian hormone modulate ovarian response to different doses of follicle-stimulating hormone in Japanese Black donors
Hiroaki OKAWA, Norihiro YUKIYAMA, Oky Setyo WIDODO, Kanae NIIMI, Yuta CHUMAN, Yasuo FUSHIMI, Mitsuhiro TAKAGI
Volume 70, Issue 6, Pages 418-422
DOI https://doi.org/10.1262/jrd.2024-067

Application of bovine progesterone intravaginal controlled-release formulation for estrus synchronization treatment in goats
Kotaro SAITO, Tomomi TANAKA, Natsumi ENDO
Volume 70, Issue 6, Pages 423-426
DOI https://doi.org/10.1262/jrd.2024-083

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 prepartum 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 Ca^{2+} 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 TERAKAWA, 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

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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https://www.jstage.jst.go.jp/browse/jrd/70/3/_contents/-char/en

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

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

Hiromi 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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https://www.jstage.jst.go.jp/browse/jrd/70/2/_contents/-char/en

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 YAMANOUCHI, 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 LAOHARATCHATATHANIN, 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, Satohiro 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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https://www.jstage.jst.go.jp/browse/jrd/70/1/_contents/-char/en

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