

Chair Animal Genetics and Reproduction

2.4.7 Laboratory : Laboratory of Reproductive Biology

Member:	Professor	Imai, Hiroshi
	Associate Professor	Yamada, Masayasu
	Senior Lecturer	Minami, Naojiro
	Doctor's program	5
	Master's Program	7
	Undergraduate	4

A. Research Activities (2010.4-2011.3)

A-1. Main Subjects

a) Development and Differentiation in Mammalian Embryos

The regulatory factors required for in vitro maturation, fertilization and development of eggs are studied. We found that IVM/IVF embryos require some unknown factors from follicle cells during maturation for their further development, so now we are focusing on elucidation of the molecular mechanisms of this intracellular communication between oocytes and follicle cells. In addition, genes and proteins that are involved in the preimplantation development and differentiation are also studied using mouse embryo culture system.

b) Analysis of nuclear reprogramming of mammalian somatic cells

It has become possible to produce clone animals derived from differentiated somatic cells using nuclear transfer technique, however, it is still unknown how can differentiated cells acquire totipotency during development. In addition, the great majority of reconstituted embryos die after nuclear transfer without involvement of ontogenesis. In our laboratory, reprogramming mechanisms of differentiated cells and embryonic anomaly during embryogenesis are examined using cell and molecular biological techniques.

c) Establishment and application of stem cell lines from of germ cells and artificially reprogrammed cells

Development of techniques to establish embryonic, spermatogenic and artificially reprogrammed stem cells having pluripotency is undertaken. Reconstitution of embryos and production of transgenic animals using the stem cells are studied. We are intending to utilize stem cell lines to apply transgenic technique for improvement of livestock animals.

A-2.Publications and presentations

a) Publications

Books

- Imai, H.: Biology Dictionary (Ishikawa T. et al. Eds.), Tokyo Kagaku Dojinn Publ., Tokyo, 2010.

Original Papers(including book-reviews)

- Kioka N, Ito T, Yamashita H, Uekawa N, Umemoto T, Motoyoshi S, Imai H, Takahashi K, Watanabe H, Yamada M. and Ueda K.: Crucial role of vinexin for keratinocyte migration in vitro and epidermal wound healing in vivo. Exp. Cell. Res. 316 (10); 1728-1738, 2010 (査読有)

- Goel S, Reddy N, Mandal S, Fujihara M, Kim S-M and Imai H: Spermatogonia-specific proteins expressed in prepubertal buffalo (Bubalus bubalis) testis and their utilization for isolation and in vitro cultivation of spermatogonia. Theriogenology 74 (7): 1221-1232, 2010 (査読有)

Reviews

- Hoshino Y, Minami N and Imai H.: Construction of the management system by RFID tag for distribution of semen in Japanese Black cattle.

- Kitamura N, Matsumoto M and Imai H: Induction of reprogramming on mammalian somatic cells in cell-free extracts.

b) Conference and seminar papers presented

- The 43rd Annual Meeting of the Society for the Study of Reproduction, 2 presentations

- The 8th Annual Meeting of International Society for Stem Cell Research, 2 presentations

- The 11th International Symposium on Spermatology, 2 presentations

- The 103th Annual Meeting of Japanese Society of Animal Reproduction, 1 presentation

- The 135th Annual Meeting of Japanese Society of Fertility and Sterility (Western Branch), 2 presentations

- The 7th Annual Conference of the Asian Animal Reproductive Biotechnology Society

A-3.Off-campus activities 1

Membership in academic societies

- Imai, Hiroshi, D.Agric.Sci : Japan Embryo Transfer Society (Vice President, Director), Japan Society for Reproductive Medicine (Director), Japanese Society of Animal Reproduction (Director), Japan Society of Fertilization and Implantation (Director), Japanese Society of Zootechnical Science (Councilor), Kansai Society of Zootechnical Science (Councilor)

- Yamada, Masayasu, D. Med. Sci : Japan Society for Reproductive Medicine (Executive Editor), The Japanese Society of Animal Reproduction (Councilor), Japan Embryo Transfer Society (Officer, Editor-in-Chief)

- Minami, Naojiro, D. Agri. Sci : The Japanese Society of Animal Reproduction (Managing Editor, Councilor), Japan Embryo Transfer Society (Officer), Japan Society for Reproductive Medicine (Deputy • Officer • Editor)

A-3.Off-campus activities 2

Research grants

1. Grants-in-aid for Scientific Research(KAKENHI)

- Grant-in-Aid for Scientific Research (B) : Imai, Hiroshi : In vitro culture and differentiation of germ stem cells from the testis in domestic species.
- Cooperative Research Program between Japan and India : Imai, Hiroshi : Preservation of endangered species and genetic resources by animal biotechnology.
- Grant-in-Aid for Challenging Exploratory Research : Inaba, Toshio (Co-investigator: Imai, Hiroshi) : Generation of Canine iPS cells and their application for spine injury therapy.
- Grant-in-Aid for Challenging Exploratory Research : Minami, Naojiro : Creation of mono-sexual animal using haploid-specific gene expression during spermatogenesis

2.Other Research Grants

- Grant from Ministry of Agriculture, Forestry and Fisheries : Imai, Hiroshi (Co-investigator: Minami, Naojiro): Research project for the construction of management system for distribution of semen in Japanese Black cattle
- JST Adaptable and seamless technology transfer program : Yamada Masayasu : Technological development for promoting in vitro development of mouse somatic cell nuclear transfer embryos
- JST Adaptable and seamless technology transfer program : Minami, Naojiro : Development of sex selection technology of offsprings by producing transgenic mice

A-4.International cooperation and overseas activities 1

Membership in academic societies

- Imai, Hiroshi: International Congress of Animal Reproduction (Executive Committee Member), International Congress of the Asian Pacific Initiative on Reproduction (Executive Committee Member), 6th Asian Reproductive Biology Society (ARBS) Meeting (Cambodia, presentation)

- Minami, Naojiro: Asian Reproductive Biotechnology Society (Steering Committee) , Reproductive Biotechnology (Associate Editor)

International meetings(country,roles)

- Imai, Hiroshi :The 42nd Society for the Study of Reproduction (Milwaukee, Presentation), The 7th Annual Conference of the Asia Reproductive Biotechnology Society (Kuala Lumpur, Presentation), The 11th International Symposium on Spermatology (Okinawa, Presentation), The 8th Annual Meeting of International Society for Stem Cell Research (San Francisco, Presentation)

- Yamada, Masayasu :The 42nd Society for the Study of Reproduction (Milwaukee, Presentation), The 11th International Symposium on Spermatology (Okinawa, Presentation), The 8th Annual Meeting of International Society for Stem Cell Research (San Francisco, Presentation)

- Minami, Naojiro :The 42nd Society for the Study of Reproduction (Milwaukee, Presentation), The 11th International Symposium on Spermatology (Okinawa, Presentation), The 8th Annual Meeting of International Society for Stem Cell Research (San Francisco, Presentation), The 7th Annual Conference of the Asia Reproductive Biotechnology Society (Kuala Lumpur, Presentation)

A-4.International cooperation and overseas activities 2

Visiting Research Scholars

- Visiting Scientist 1 (India)

B.Educational Activities(2010.4-2011.3)

B-1.On-campus teaching

a) Courses given

- Undergraduate level: Outline of Bioresource Science III (Imai), Developmental and Reproductive Technology (Yamada), Introduction to Animal Science Literature I (Yamada), Methods and Techniques in Animal Reproduction Experimentation (Imai, Yamada, Minami), Biotechnology (Yamada), Reproductive Physiology (Minami)

- Graduate level: Advanced Course of Reproductive Physiology (Imai), Reproductive Physiology-Seminar (Imai, Yamada, Minami), Laboratory Course in Reproductive Physiology (Imai, Yamada, Minami), Genetic Engineering in Developmental Biology (Yamada)

B-2.Off-campus teaching etc.

Part-time lecturer

- Imai, Hiroshi: National Livestock Breeding Center (Lecturer, Animal Reproduction Training Course)

Open lectures, etc.

- Imai, Hiroshi: Special Lecture on the Japanese Biochemical Society Kyushu Branch

B-3.Overseas teaching 1

International students

- International students : Doctral 2 (Korea 1, India 1)

C.Other Remarks

- Imai, Hiroshi : Committee of Research Investigation of Agriculture, Forestry and Fisheries Technical Information Society, Committee of Research Project of Ministry of Agriculture, Forestry and Fisheries, Assessment Committee of Research Grant of Ministry of Agriculture, Forestry and Fisheries, Assessment Committee of Research Grant of Ministry of Agriculture, Forestry and Fisheries, Assessment Committee of Bio-oriented Technology Research Advancement Institution

- Yamada, Masayasu : Guest Researcher of Gifu Prefectural Livestock Institute, Guest Researcher of Toyama Prefectural Agriculture Research Center

- Minami, Naojiro : Guest Researcher of National Institute of Radiological Sciences