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Subhash Mukhopadhyay Centre
for Stem Cell Biology and Regenerative Medicine

in collaboration with

Ghosh Dastidar Institute for Fertility and Research

is offering

MSc in Clinical Embryology

under the affiliation of
Adamas University, Kolkata

SUBHASH MUKHOPADHYAY CENTRE FOR STEM CELL BIOLOGY AND REGENERATIVE MEDICINE

GDIFR

M.Sc. Clinical Embryology

2-Year Course
2026-2028

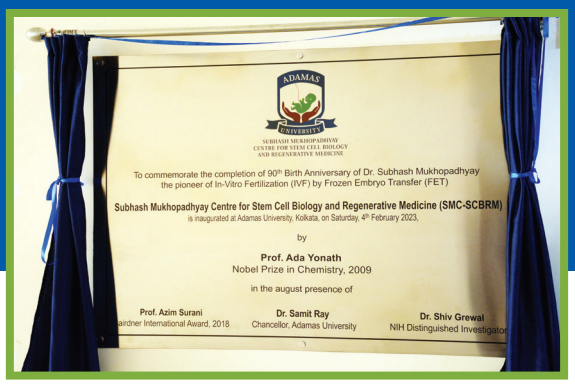
Contents

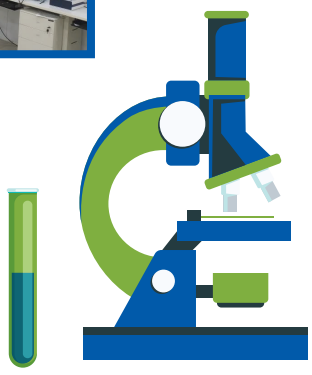
AU-SMCSCBRM - GDIFR

Subhash Mukhopadhyay Centre for Stem Cell Biology and Regenerative Medicine (AU-SMCSCBRM), named in the honour of one of the pioneers of In Vitro Fertilization (IVF), Dr. Subhash Mukhopadhyay (who for the first time utilized cryo-preserved human embryos for IVF which is incidentally the 2nd IVF in the world, barely 67-days after Sir Robert Edward's success which was recognized by the award of Nobel Prize in 2010), was inaugurated by 2009 Chemistry Nobel Laureate Prof. Ada Yonath, is a constituent germline research unit of Adamas University (AU), Kolkata. From this year, 2025, AU-SMCSCBRM is launching Master of Science (MSc) in Clinical Embryology for the 1st time in Eastern and North-Eastern India. Consequently, AU-SMCSCBRM is the only institute in Eastern and North-Eastern India that is offering MSc in Clinical Embryology for developing a strong foundation in the theoretical aspects and practical skills in the domain of Assisted Reproductive Technology (ART). On completion of the course, students would develop skills to perform routine andrology, embryology, micromanipulation of gametes & embryos, cryopreservation of gametes, embryos & ovarian tissue culture and perform embryo biopsy that are routinely performed in an IVF centre.

Ghosh Dastidar Institute for Fertility Research (GDIFR), a renowned organization in infertility treatment, is also associated with AU-SMCSCBRM for research in advanced areas of human reproduction e.g., stem cell technology / regenerative medicine. Thus, trainees will get the opportunities to witness the cutting-edge research in stem cell technology and human reproduction. GDIFR has been conducting training courses in andrology, embryology, micromanipulation and cryopreservation for the past several years.

The proposed collaboration is offering hands-on certificate course and MSc course in embryology to science and medical graduates from around the world. Equal importance is allotted to continuing academic activities, basic research, clinical research, and perfection in treatment protocols, which together results in our world-class results & pregnancy rates. AU-SMCSCBRM-GDIFR also conducts symposiums and workshops for infertility specialists and the general community.





About GDIFR

Ghosh Dastidar Institute for Fertility Research (GDIFR) is the leading IVF Clinic in Kolkata and is internationally recognized as a centre of excellence. At the helm is our director - Dr. Sudarsan Ghosh Dastidar, a pioneer with over 30 years of experience in this subject.

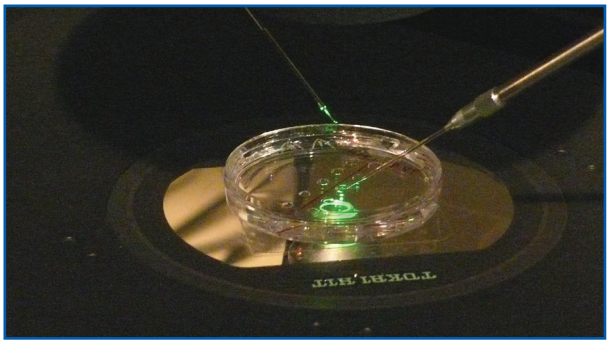
GDIFR gave birth to India's first test tube baby by Intracytoplasmic Sperm Injection - Zygote Intrafallopian Transfer (ICSI- ZIFT) technology, which till today is the most advanced of all ARTs and the last resort in case of severe, unexplained male infertility. This was followed by the birth of the first triplets by ICSI in 1996. In 2005, the Asia's first surrogate baby for a single father was born at GDIFR.

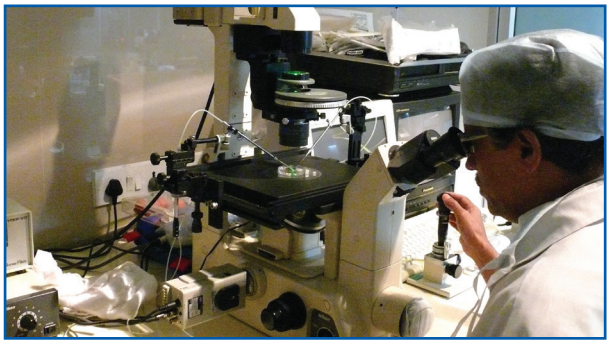
Notably, GDIFR has the highest IVF success rates in India – which is around 55% for ICSI and 50% for IVF below age group 38 years, while in certain spell success rates reach upto 60%. For patients above 38 years, success rate varies between 30-40%. With Donor IVF, success rate is about 55-60%.

Brief History about the pioneering role of Dr. Sudarsan Ghosh Dastidar in ART

Dr. Subhash Mukhopadhyay created history by his work at Calcutta in India, that paralleled the effort by Sir Robert (Bob) Edwards at Oldham in United Kingdom (UK), led to the generation of one of two test tube babies "Durga" (alias Kanupriya Agarwal) on 3rd October 1978 which was merely 67 days after the birth of the other through IVF that eventually was recognized by Nobel Prize in 2010.

After Dr. Mukhopadhyay's death, his student, Dr. Ghosh Dastidar, decided to re-establish research in IVF. He had realized that the backbone of infertility treatment had to be the laboratory and associated technology and not surgical methods which were the practice till then. But there was absolutely no knowledge, know-how or infrastructure for an embryology laboratory in India at the time and so it had to be developed from absolute scratch by trial and error and self-learning. He approached an eminent gynecologist based in Kolkata and they decided to embark upon this journey where the clinical aspects would be handled by the former and it was upon Dr. Dastidar to independently and indigenously develop a laboratory. Thus, was born India's first self-trained embryologist, who established the first rudimentary lab which was destined to result in India's first IVF pregnancy.





In 1982 Dr. Ghosh Dastidar was a major contributor in independently developing a lab protocol of IVF in Kolkata, leading to the birth of India's 2nd IVF baby in 1986, who was incidentally India's first IVF baby boy "Imran". Back then there was no modern CO2 incubator to incubate human eggs. Dr. Ghosh Dastidar indigenously developed an improvised embryo culture system, which could be used to preserve eggs in culture media. He developed Kolkata's first IVF laboratory (very primitive) in his study room at 79/28 A J C Bose Road Kolkata-14. He spend hours studying oocyte and cells. Back in 1980's there were no books on IVF or infertility, no clear photographs of human oocyte or embryo. Hence everything had to be learnt by trial and error. After many failures Dr. Dastidar achieved fertilization of oocyte and subsequent cleavage to the 6-8 stage in June-July '83. Following transfer of this fertilized oocyte a pregnancy occurred (September '83), unfortunately this ended up in abortion in 10 weeks. It was a major breakthrough as it showed that IVF could be used as a method to treat tubal factor infertility.

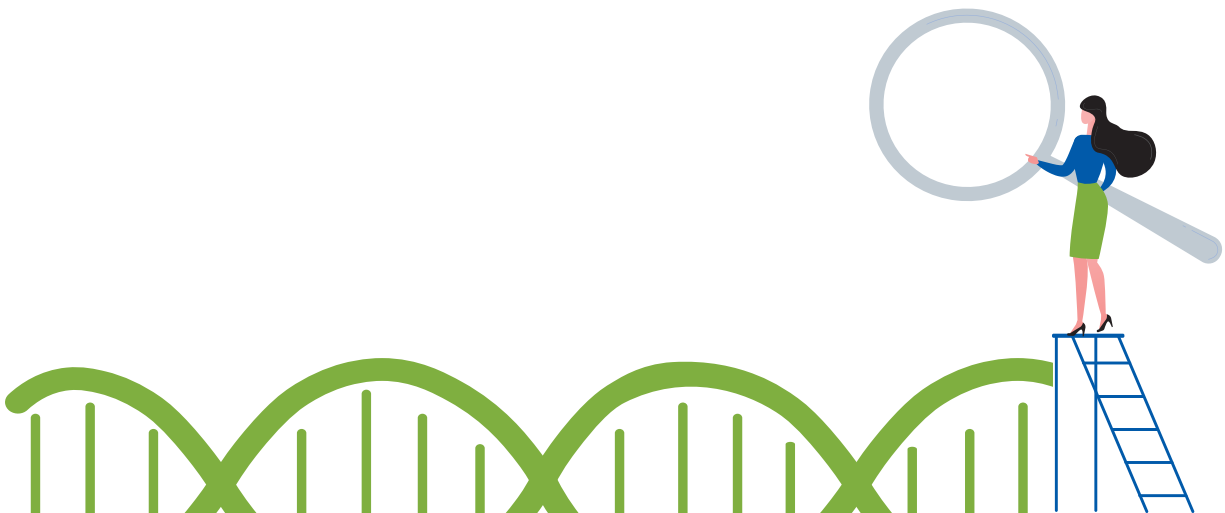
Dr. Ghosh Dastidar has also been credited with the 1st Intra uterine insemination (IUI) pregnancies in the India which was in 1983.
Dr. Ghosh Dastidar was awarded Lifetime Achievement Awards by Indian Council for Medical Research (Government of India), Government of West Bengal as well as by Indian Society for Assisted Reproduction (ISAR). More recently, he has been tasked by the Government of West Bengal to develop Eastern India's 1st free IVF program for poor patients and has been the architect behind the delivery of the first IVF baby at the state government hospital on 4th October 2024.

AU-SMCSCBRM - GDIFR Facilities

AU-SMCSCBRM is the first of its kind human stem cell research unit in Eastern and Northeastern India to have been registered with the National Apex Committee for Stem Cell Research and Therapy (NAC-SCRT) under Indian Council for Medical Research (ICMR), Government of India. SMCSCBRM has the requisite clearance from the Department of Biotechnology (DBT)-Stem Cell Steering Committee in accessing human embryonic stem cells to conduct research in stem cells and regenerative sciences. Besides, having access to both the endogenous male and female human embryonic stem (ES) cell lines of India, SMCSCBRM also has access to widely used human ES cell lines from the University of Cambridge, UK. These human ES cell lines are being utilized to indigenously accomplish in-vitro gametogenesis (IVG) which shall have pathbreaking implications in improving the success rates in ART and other clinical etiology related to reproductive medicine at large. Alongside, there are all the reagents to train individually with the laboratory practical.

It houses a clean room equipped with following facilities:

Sl. No.	Generic name of Equipment	Model & Make	Year of Purchase
1	Normaic and hypoxic incubators	HERAcell VIOS 160i, Thermofisher Scientific	2021
2	Biological Safety Cabinet/Cell-culture hood	1300 series Class II, Type A2 4 ft, Thermofisher Scientific	2021
3	Bead bath	SAP18, Grant	2022
4	Cell Counter	PHCC340KIT Scepter™ 3.0 Merck Millipore	2022
5	Centrifuge	Minispin, Eppendorf	2021
6	Microscope	Axio Vert.A1 TL/RL-LED, Zeiss	2022
7	Nucleofection System	4D-Nucleofector® System with 4D-Nucleofector® Core Unit (AAF-1003B) and 4D-Nucleofector® X Unit (AAF-1003X), Lonza	2025



In addition, here is the list of other operational instruments:

Sl. No.	Generic name of Equipment	Model & Make	Year of Purchase
1	Full spectrum micro-volume UV-Vis spectrophotometer	NanoDrop One,Thermofisher Scientific	2021
2	-80 degree freezer	FDE40086LV,Thermofisher Scientific	2021
3	Liquid Nitrogen storage system with level monitor	Locator 6 plus, Thermofisher Scientific	2021
4	Thermomixer	ThermoMixer C, Eppendorf	2021
5	4 degree centrifuge	5810 R, Eppendorf	2021
6	Direct detection two-colour infrared imaging system	OdysseyCLx, Licor Biosciences	2022
7	Real Time PCR Detection System	CFX Connect, Biorad	2021
8	Geldoc	GelDoc Go, Biorad	2021
9	Thermal cycler	T100, Biorad	2021
10	Ice Flakes Machine	Blue Star SLF190AG	2022
11	4 degree refrigerator	PL6500,Thermofisher Scientific	2022
12	-20 degree freezer	PL6500, Thermofisher Scientific	2022
13	Water Purification System for Type 1, Type 2 & Type 3 water	PURELAB Quest UV, Elga Veolia	2022
14	Fume Hood	Citizen Industries	2022
15	Multimode Microplate Reader	Varioskan™ LUX multimode microplate reader VLBL00D0, Thermo Scientific™	2022
16	Nucleofection System	4D-Nucleofector® System with 4D-Nucleofector® Core Unit (AAF-1003B) and 4D-Nucleofector® X Unit (AAF-1003X), Lonza	2025
17	Sonicator	Bioruptor® Plus , Diagenode	2025

GDIFR is one of the first IVF/ART Centre offering comprehensive fertility/IVF treatment under one roof including infertility screening and diagnosis.

(a) Fertility hormones test of both male and female patients
(b) Advanced ultrasound unit with 3D/4D and color doppler, transvaginal ultrasound (TV/USG) for fertility disorder diagnosis.
(c) In house Operation Theatre (OT) facility for day care patients undergoing hysteroscopy and laparoscopy for patients undergoing operations.

Andrology Lab:

(a) Advanced andrology procedure including semen parameter, sperm washing, Intrauterine Insemination (IUI)/IVF/Intra Cytoplasmic Sperm Injection (ICSI), sperm function test like Hypo Osmotic Swelling (HOS), critical sperm morphology etc.
(b) Sperm cryo-preservation

ART LAB:

(a) State-of-the-art ART with all facilities - IUI/IVF/ICSI/Laser Hatching/embryo biopsy
(b) Oocyte or embryo vitrification and oocyte banking
(c) Regular quality control and data recording
(d) Research and development in ART

About the course and opportunities

The first two babies through the process of IVF was born in the year 1978 in the UK and India. Since then, IVF centres have mushroomed around the world. Infertility affects about 15-20% of married couples and is a huge social problem in many countries including India. In India alone, there are more than 2000 IVF centres to treat infertile couples and this number would increase 2-3 folds by the year 2020. The exponential growth of IVF centres has necessitated the need for qualified embryologists. At the moment, there is a huge shortage of in house embryologists and the MSc course has been designed to meet the shortage of qualified embryologists and regulatory requirements of ICMR (Indian Council of Medical research) and regulatory bodies in other countries.

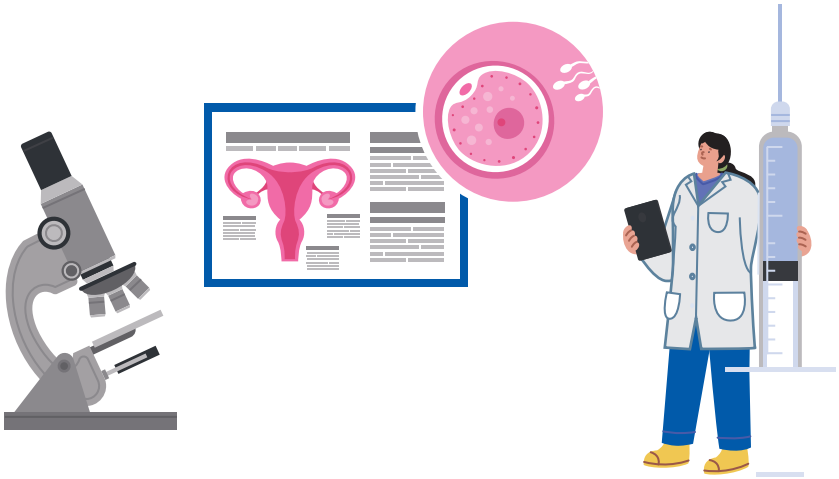
This course will introduce the students about the basis and various facets of early embryonic development, and as such, shall instill deep insights and ingrain combined practical expertise on clinical embryology and pre-implantation genetics. Thus, although the primary objective of this joint academic-industry venture course roll-out is to generate industry-ready professionals in Assisted Reproductive Technology (ART) to meet the rising demands for ART technicians across IVF centres across the globe, our course will not only harness skills in clinical embryology but shall also inculcate technical attributes in embryo biopsy for pre-implantation genetic screening.

Career opportunities

Clinical embryology is an exciting and growing filed. A masters in this field will prepare students to take up career as an embryologist in the IVF centre to perform embryological work and also embryo biopsy to identify genetic diseases. After MSc, students can pursue PhD or work as embryologist while pursuing PhD.

Eligibility conditions

Students of Bachelors of Science (BSc) / Technology (BTech) degree from any UGC recognized Universities/MBBS/, Pharmacy, BVSc, and Engineering with Science (Biotechnology and Life science related) or any other equivalent degree are eligible to apply for this course. Students with Foreign National degree will apply through equivalence committee. Candidates with 50% and above are eligible to apply for this course.



Course Deliverables

At completion of the course, students will be able to

1. Acquire the basic understanding of human reproduction, genetics and infertility
2. Acquire the theoretical aspects of clinical andrology, embryology and Pre- implantation genetic diagnosis
3. Develop skills to handle andrology laboratory techniques, sperm function tests and processing of semen for various procedures
4. Develop an understanding of how IVF laboratory works
5. Develop routine embryology laboratory skills including the handling of gametes and embryos.
6. Develop skills in the micromanipulation of gametes and embryos
7. Develop skills in the cryopreservation of gametes, embryos and reproductive tissues and apply those skills in a clinical setting
8. Develop skills in embryo biopsy
9. Develop an understanding on the legal aspects that regulates ART practice and the ethical issues surrounding ART practice
10. Review literature, design and carry out basic and clinical research
11. Able to teach clinical embryology and pre-implantation genetic diagnosis but not teach fulltime genetics

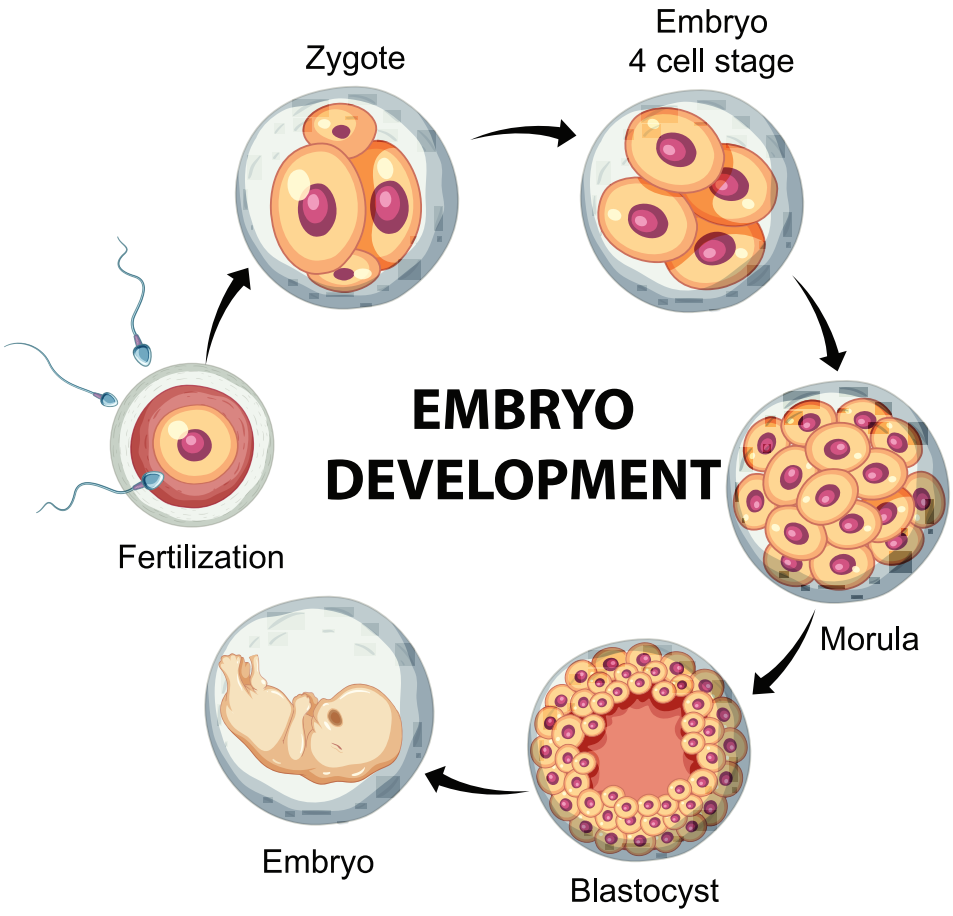
Course Structure

The course structure for this 2-year MSc programme has been framed by strictly adhering to the National Education Policy (NEP) 2020 guidelines, whereby in each of the first 3 semesters the students will undertake 3 core courses (CC), a department-specific elective (DSE) course, either a course on research methodology (in the 1st semester) or a course accessible through the government of India portal SWAYAM (Study Web of Active Learning by Young and Aspiring Minds) offering Massive Online Open Courses (MOOC), as well as a hands-on field project. Students will undertake a research project work in the final semester.

Course Recognition

MSc in Clinical embryology & Pre-implantation Genetics will be awarded by the Department of Allied Health Sciences under the School of Health and Medical Sciences of the NAAC-A accredited Adamas University which is the 1st and currently the only private university with NAAC accreditation in the state of West Bengal. The MSc course is laboratory based and doesn't involve handling humans and hence approval of MCI (medical council of India) is not required (The MCI grants recognition of medical qualifications, gives accreditation to medical colleges, grants registration to medical practitioners and monitors medical practice in India).

The proposed ART bill by the Indian Council of Medical Research (ICMR) requires embryologists to have a masters' degree to work in an embryology/IVF laboratory and the above course meets the requirements as it specifically involves clinical embryology and pre-implantation genetics and hence an advantage who wants to pursue a career in embryology. Further, it is mandatory to have an in- house clinical embryologist in each IVF centre according to proposed ART bill.



Course Fees

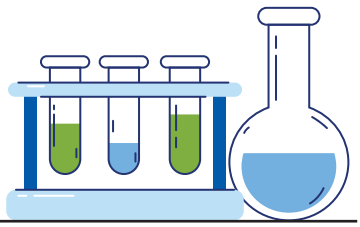
The current fee for the 2-year course is 8 lakhs (Rs. 2 lakhs/semester to be paid before the beginning of each semester). Fees is subject to change (approximately 10% increase) which will be announced in the first quarter of every year. For deserving candidates, there is a provision of waving 1 lakh from aforesaid tuition fees as scholarship.

Foreign students will pay US$14000 as fees for the 2-year program in equal instalments before the beginning of each semester.

Instructions to Candidates for Admission

1. Application with incomplete or incorrect information and without enclosures is liable for rejection
2. All Original Documents should be produced at the time of admission for verification by the university
3. Two passport photographs should be produced.
4. AU-SMCSCBRM - GDIFR will issue letter to foreign students for visa purpose.
5. AU-SMCSCBRM - GDIFR will issue letter for loan purposes after securing admission offer to the course

The course starts on Monday, 8th September.



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