Tanmoy Sarkar

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+91-7982143662

1. Resume Objective

A motivated research scholar with experience in biological studies and statistics, with a keen interest in computers. I like to look for the greater scheme of things in the minutest of details.

2. Experience

2.1. Worked as a PhD research scholar at CSIR-Institute of Genomics & Integrative Biology (IGIB), New Delhi from August 2014 to December 2021.

Adviser

Dr. Sagarika Biswas

Dissertation

Cytokine-mediated modulation of stem cell behavior in rheumatoid arthritis.

Accomplishments:

1. Establishment of a viable cell culture laboratory setup.
2. Dissection of *Rattus norvegicus* and extraction of live stem cells by femoral flushing.
3. Establishment of viable primary cell culture and cytokine treatments.
4. Proteomic and statistical analyses.

2.2. Worked as a research assistant at Presidency University, Kolkata from December 2012 to July 2013.

Adviser

Dr. Prabir Mukherjee

Accomplishments:

1. Arsenic toxicity studies on *Rattus norvegicus*
2. Histological assessments of *Rattus norvegicus* tissue samples.

2.3. Worked as a PhD research scholar at Department of Biotechnology (DBT)-Centre for DNA Fingerprinting & Diagnostics (CDFD), Hyderabad from August 2011 to June 2012.

Adviser

Dr. Subhadeep Chatterjee

Dissertation

Plant-microbe interactions in Xanthomonas quorum sensing.

Accomplishments:

1. Plasmid-mediated bacterial genetic engineering.
2. Establishment of plant-bacterial co-cultures.

2.4. Completed Masters dissertation at Utkal University, Bhubaneswar from January 2011 to July 2011.

Adviser

Dr. Priyankar Sen

Dissertation

Age-dependent DNA methylation at catalase gene promoter region of *Rattus norvegicus*.

Accomplishments:

1. Methylation-sensitive restriction enzyme-mediated digestion of genomic DNA.
2. Polymerase chain reaction (PCR)-mediated DNA fragment amplification.
3. Sodium bisulfite conversion of amplified fragments and analysis.

2.5. Completed Bachelors dissertation at Presidency College, Kolkata at January 2009.

Adviser

Late Dr. Chandan Mitra

Dissertation

Assessment of physiological, ergonomical and hematological parameters of tribal populations in Madhya Pradesh, India.

Accomplishments:

1. Respiratory survey using pneumography.
2. Anthropometric profiling.
3. On-field hematological testing and surveying.

3. Skills

3.1. Medical Physiology

3.1.1. Experimental Physiology

- Kymography

Muscles	Parameters
Cardiac	Load
Skeletal Gastrocnemius	Temperature
Smooth Intestinal	Perfusion
-	Fluid pressure
-	Ion concentrations
-	Hypoxia
-	Acetylcholine and Adrenaline

- Ringer's solution preparation

3.1.2. Work Physiology

- Sphygmomanometric measurement of arterial blood pressure
- Modified Harvard Step Test for physical fitness
- Pneumographic recordings of respiratory movements
- Spirometric measurement of vital capacity

3.1.3. Histology

- Silver Nitrate staining
- Hematoxylin-Eosin staining
- Identification of permanent slides
- Preparation of permanent slides
  a. Fixing
  b. Dehydrating
  c. Paraffin embedding
  d. Preparing blocks for microtomy
  e. Microtomy and staining

3.1.4. Hematology

- Leishman's staining of blood film
- Blood corpuscular identification - basophils, eosinophils, neutrophils, monocytes, megakaryocytes
- Using hemocytometer for counting
  a. Total count of red blood corpuscles (RBCs)
  b. Total count of white blood corpuscles (WBCs)
  c. Differential count of WBCs

3.1.5. Biochemistry

Calculation of

- Blood sugar by Folin-Wu method
- Serum protein by Biuret method
- Blood uric acid by cyanide-free method
- Serum urea by DAM method
- Percentage of lactose in milk by Benedict's method

3.1.6. Ergonomics

Measurement of anthropometric parameters for calculations like Body Mass Index (BMI), ponderal index:

- Stature
- Weight
- Eye height
- Shoulder height
- Eye height (sitting)
- Elbow height
- Sitting height
- Elbow rest height (sitting)
- Knee height (sitting)
- Shoulder elbow length
- Arm reach from wall
- Elbow-to-elbow breadth
- Knee-to-knee breadth (sitting)
- Shoulder breadth
- Head length
- Head breadth
- Head circumference
- Neck circumference
- Mid-arm circumference
- Waist circumference
- Hip circumference
- Chest circumference.

3.1.7. Microbiology

- Gram staining of bacteria
- Suspension culture of *Escherichia coli* (E. coli)
- Protein extraction and estimation from E. coli
- Plasmid extraction and estimation from E. coli

3.1.8. Animal handling

Ethics committee and animal facility approved dissection of animals and collection of samples for further experiments.

3.2. Stem Cell Culture

3.2.1. Primary cell culture

- Isolation of tissue
- Tissue disaggregation by
  a. Cold trypsinization
  b. Mechanical disaggregation
- Enrichment of viable cells by Ficoll-Hypaque method

3.2.2. Cryopreservation in liquid Nitrogen

- Ampoule preparation
- Cytotoxicity studies by
  a. Trypan Blue staining
  b. MTT assay

3.2.3. Cell separation

- Density gradient centrifugation
- Fluorescence-Assisted Cell Sorting (FACS)

3.2.4. Cell characterization

- Microscopy
  a. Inverted microscopy
  b. Compound microscopy
  c. Confocal microscopy
- Cell staining
  a. Giemsa staining
  b. Crystal Violet staining
- Immunostaining using monoclonal antibodies and polyclonal antisera
  a. Enzyme-linked Immunosorbent Assay (ELISA)
  b. Peroxidase-anti-peroxidase (PAP) staining

3.2.5. Cell quantitation

- Cell counting using hemocytometer
- Cell proliferation measurement using population doubling time
- Plating efficiency calculation

3.2.6. Culture maintenance

- Subculture and propagation following split ratios at subculture intervals
- Complete media formulation and replacement
- Serum handling and heat inactivation
- Administration of antibiotics
- Laminar air-flow (LAF) hood maintenance and checking for contamination

3.2.7. Cell lysis for further studies

- Preparation of cellular extracts by homogenization
- Formulation of lysis buffers
- Differential fractionation using Tween20
- Protein estimation using Bradford assay

3.3. Molecular Biology

3.3.1. Proteomics

- Sodium dodecylsulphate (SDS) polyacrylamide gel electrophoresis (PAGE)
- 2-dimensional PAGE (2D-PAGE)
- Isoelectric focusing (IEF) using immobilized pH gradients (IPG) gel strips

- Coomassie Brilliant Blue (CBB) and Ponceau gel staining
- Mass spectrometer (MS)-compatible silver nitrate staining
- Western blotting
- Enzyme-linked Immunosorbent Assay (ELISA)
- Matrix-assisted laser desorption-ionization (MALDI) time-of-flight (TOF) MS analysis

3.3.2. Gene Cloning and Vector Engineering

- pBR322 plasmid
- Primer designing
  a. BLAST
  b. FASTA3
  c. ClustalW
- Restriction mapping using restriction endonucleases

3.3.3. Epigenetic profiling

- Sodium bisulfite treatment of promoter region CpG islands

3.3.4. DNA/RNA Extraction, Quantification and Amplification

- Agarose gel electrophoresis
- Ethidium bromide (EtBr) staining
- Southern blotting
- Polymerase Chain Reaction (PCR)
  a. Reverse Transciptase PCR (RT-PCR)
  b. Quantitative Real Time PCR (qRT-PCR)

3.3.5. Bacterial Cell Culture

- Media preparation for suspension broth and agar-based gel culture
- Transformation using electroporation

3.4. Statistics

3.4.1. Hypothesis testing using R

- One-sample t-tests
- Two-sample t-tests
- One-sample z-tests
- Two-sample z-tests
- Paired t-tests
- Mann-Whitney tests
- Chi-square tests

3.4.2. Regression modeling using R

- One-way analysis of variance (ANOVA)
- Two-way ANOVA

3.4.3. Using R for calculating

- standard deviation
- standard error
- error bars
- correlation coefficient

3.4.4. Other necessary statistical skills not requiring R include

- statistical modeling
  a. regression model
  b. categorical regression model
  c. multivariate regression model or ANOVA model
- sample size determination
  a. effect size
  b. significance level
  c. population variation

3.5. Computer Skills

3.5.1. GNU/Linux commandline interface (CLI) tools especially useful for academic research, of which I am well versed in:

Name	Academic Uses
groff	a simple document formatting system used for creating PDF documents including publications, resumes, articles, based on the original Unix troff/nroff [1]
tbl	a table preprocessor program for groff
refer	a reference preprocessor program for groff
LaTeX	a more powerful typesetting system for creating PDFs
BibTeX	a reference management program for LaTeX
imagemagick	image manipulation useful for converting raw image files to .TIFF for publication, .JPEG for other purposes
neovim	a modern powerful text editor, based on the original vi editor
grep	search strings within documents
find	search for documents within the filesystem
sed	an in-line text editor
xargs	useful for piping commands in conjunction with other arguments
awk	a powerful pattern scanning and processing language
fzf	the commandline fuzzyfinder, important when you don't know the exact filename
markdown	quick and dirty notetaking language
bash	the Bourne-again Shell where all the magic happens
diff	useful for finding differences between two versions of a document, useful for collaboration, authoring academic papers, can be outputted to diff files
patch	apply diff files for changes to original file
git	version control system, useful for collaboration, rolling back changes, multi-author edits

3.5.2. GNU/Linux GUI tools necessary for image creation and quantification, useful for academic research of which I am familiar with:

Name	Academic Uses
ImageJ	quantify image pixels used for semi-quantitative assessments
Inkscape	create raster-free vector images useful to illustrate models for publications
OpenSCAD	create vector 3D images for illustration of DNA and other biomolecules

3.5.3. Other GNU/Linux tools:

Sysadmin	Languages
systemd	C
ssh	Python
mkfs	
top	

3.5.4. Instrumentation softwares, whose alternatives are not available in the Free and Open Source Software (FOSS) world of GNU/Linux, I am familiar with:

Name	Applications
BD FACScalibur	for Fluorescence Assisted Cell Sorting
Roche LightCycler 480	for Real Time Polymerase Chain Reaction
Biorad Image Lab	for ChemiDoc MP gel documentation system
Nanodrop 1000	for DNA/RNA quantification
PDQuest	for analyzing 2D-PAGE gels

4. Education

[1] This document is prepared in neovim using groff.

Qualification	Year	% Marks	Division	University
Master's of Science in Biotechnology	2011	79.4	First[2]	Utkal University, Bhubaneswar
Bachelor's of Science (3-year course with Honours) in Physiology	2009	58.9	Second[3]	University of Calcutta
All India Senior School Certificate Examination	2006	82.8	First[4]	Central Board of Secondary Education
All India Secondary School Examination	2004	78.4	First[5]	Central Board of Secondary Education

5. Honors and Awards

Fellowship/Award	Year	Rank	Score	Bestowing Organization
Senior Research Fellowship (SRF)	August 2016	NA	NA	University Grants Commission (UGC)
National Eligibility Test for Lectureship (NET)-JRF	July 2015	064	NA	Council of Scientific & Industrial Research (CSIR)
Junior Research Fellowship (JRF)	August 2014	NA	NA	University Grants Commission (UGC)
National Eligibility Test for Lectureship (NET)-JRF	July 2014	048	NA	University Grants Commission (UGC)
National Eligibility Test for Lectureship (NET)-JRF	July 2011	091	NA	Council of Scientific & Industrial Research (CSIR)
Graduate Record Examinations (GRE) General Tests	May 2012	NA	052 [6]	Educational Testing Service (ETS)
Graduate Aptitude Test in Engineering (GATE)	2011	515	048	Indian Institute of Technology Madras (IITM)
Kishore Vaigyanik Protsahan Yojana (KVPY) National Fellowships for Students Interested in Research Careers	2006	NA	NA	Indian Institute of Science (IISc), Bangalore
National Level Science Talent Search Examination (NSTSE)	2006	352	060	Unified Council India

6. Publications

6.1. Research Article(s)

- Sarkar, A., Sharma, S., Agnihotri, P., **Sarkar, T.**, Kumari, P., Malhotra, R., Datta, B., Kumar, V., Biswas, S.[7] Synovial fluid cell proteomic analysis identifies upregulation of alpha-taxilin proteins in rheumatoid arthritis: a potential prognostic marker. *Journal of Immunology*. 2020. DOI: 10.1155/2020/4897983

6.2. Conferences

[2] Subjects: Cell Biology & Genetics, Biomolecules & Biophysical Chemistry, Microbial Physiology & Genetics, Biotechniques, Molecular Biology, Enzyme Technology, Immunology, Biostatistics, Animal Cell Culture, Genetic Engineering, Plant Biotechnology, Intermediary Metabolism, Environmental & Marine Biotechnology, Bioprocess Engineering & Technology

[3] Subjects: Physiology Hons., Physics General, Chemistry General, Environmental Sciences, English Mandatory

[4] Subjects: English, Mathematics, Physics, Chemistry, Biology, Information Practices

[5] Subjects: English, Mathematics, Science, Social Sciences, Hindi

[6] Average of:

- Verbal Reasoning 064
- Quantitative Reasoning 082
- Analytical Writing 011

[7] Corresponding author: Sagarika Biswas sagarika.biswas@igib.res.in

6.2.1. Attended/Organized

Name	Year	Organization
Emerging Trends in Biotechnology & Drug Discovery	2017	CSIR-Institute of Genomics & Integrative Biology (IGIB), New Delhi
18th Annual Conference of the Physiological Society of India	2006	Department of Physiology, Presidency College, Kolkata

6.2.2. Poster presented

Name	Year	Organization
38th All India Cell Biology Conference and International Symposium on*Cellular Response to Drugs*	2014	CSIR-Central Drug Research Institute(CDRI), Lucknow

7. Other Activities

Indoor	Outdoor
Reading novels	Traveling
Looking at maps	Hiking
Pondering local histories	Camping
Looking up train schedules and routes	
Cooking	
Listening to podcasts	
Table tennis	

8. Personal Details

Particulars	Details
Date of Birth	24th September 1988
Father's Name	Tapan Kumar Sarkar
Mother's Name	Sabitri Sarkar
Gender	Male
Marital Status	Married
Spouse's Name	Supriya Sarkar Ghosh
Locality	Kampa Lake Road
Landmark	Near Kampa Pumphouse
Vill	Nagdaha
P.O.	Kampa
City	Kanchrapara
R.S.	Kanchrapara
P.S.	Bizpur
Dist.	North 24 Parganas
State	West Bengal
Nation	INDIA
PIN	743193

9. Languages

- **Bengali** Native proficiency
- **English** Professional working efficiency [8]

10. References

1. **Dr. Sagarika Biswas**, Scientist 'F', CSIR-IGIB, Proteomics lab, Room 311, North Campus, Mall Road, near Jubilee Hall, Delhi University campus, Delhi. PIN 110007. Phone: +91-1127662581
2. **Dr. Dakshayani Mahapatra**, Assistant Professor (W.B.E.S), Department of Physiology, Government General Degree College, Mohanpur, Paschim Medinipur, West Bengal. PIN 721436. Email: dakshayani.mahapatra@gmail.com. Phone: +91-9830655682
3. **Dr. Sumit Kumar Gautam**, Lead Scientist, Clear Meat Pvt. Ltd., B 78, First Floor, Sector 2, Noida, Near Sector 15 Metro Station. PIN 201301. Email: sumit.k@clearmeat.com. Phone: +91-8826954099

[8] Test of English as Foreign Language (TOEFL) Internet-based Test (iBT) score of 098/120, August 2012