**Dr. Raja CHINNAPPAN, Lecturer**
Biochemistry and Molecular Medicine, Alfaisal University,
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## AREA OF SPECIALIZATION

- Aptamer-based biosensor development for the sensitive detection of Clinical biomarkers, pathogenic microbial organisms, and potential contaminants such as toxins, hormones, antibiotics, and food allergens.

## RESEARCH EXPERIENCE AND PROJECTS

**Lecturer,** Alfaisal University, Riyadh, Saudi Arabia 2015 - Till date

### Current Research

- Developing Point-of-care testing for the diagnosis of liver diseases
- Quantitative detection of human serum albumin sensor using a specific fluorescence molecules
- Aptamer selection against anti-coagulant drug Dabigatran Etexilate
- Fluorometric graphene oxide-based detection of Salmonella enteritis using aptamer as recognization element.
- Development of immuno-biosensor for the detection of pathogenic bacteria from water and food
- Development of Colorimetric biosensor for the detection of mastitis diseases from dairy products
- Protease-based biosensor for the identification of human pathogenic bacteria from the clinical samples
- Detection of microRNA cancer biomarkers by FRET and RT-qPCR
- Aptamer-based biosensor development for the decontamination of antibiotics from environmental samples (wastewater)
- Aptasensor development for the sensitive detection of allergens from seafood.
- Development of biosensors for the sensitive detection of marine toxins contamination from water resources and seafood.

### Teaching (M.Sc and B.Sc)

- Principles and Applications Optical Spectroscopy (M.Sc)
- Co-supervisor for Master and Ph.D. Thesis
- Separation and purification Techniques ( B.Sc)
- Spectroscopic techniques for characterization of organic compounds ( B.Sc)

- Physical Methods in Chemistry and Instrumental analysis in chemistry (B.Sc)
- Introduction to Chemistry CHM 102 ( For engineering)
- Chemistry in Everyday Life and Environment CHM 107 ( For business)

## PATENTS

- **R. Chinnappan** S. Eissa, M. Aljohani , M. Zourob Full-length and truncated Anti-Coagulant Dabigatran Etexilate specific DNA aptamers for electrochemical and fluorescence sensing applications, **US Patent (2020)**
- S. Eissa, A. Siddiqua, **R. Chinnappan**, and M. Zourob, Electrochemical screening method for the selection of DNA aptamers against 11- deoxycortisol using gold electrode for target immobilization, **US patent, 2019**.

## BOOK CHAPTERS

- Shimaa Eissa, **Raja Chinnappan**, Mohammed Zourob. **2017**. Advances in Biosensor Technologies for Food Allergen Monitoring and Diagnosis in Food Allergy in Methods of detection and clinical studies. Ed. Anas Abdel Rahman, *CRC Press/ Taylor & Francis Group* **2017.**

## PEER REVIEWED PUBLICATIONS

1. **R Chinnappan**, T Mir, S Easwaramoorthi, G Sunil, A Feba, B Kanagasabai, S I Wani, M. Sandouka, A Alzhrani, S Devanesan, M S. AlSalhi, N K Mani, W Al-Kattan, Ahmed Yaqnuddin1, A M Assiri, DC Broering. Molecular engineering of a fluorescent probe for highly efficient detection of human serum albumin in biological fluid, Sensors International, **2024** ( Accepted)
2. **R Chinnappan**, T Makhzoum, M Arai, A Hajja, F Abul Rub, I Alodhaibi, M Alfuwais, M A Elahi, E A Alshehri, L Ramachandran, N K Mani, S Abrahim, M Mir, K Al-Kattan, T Mir, A Yaqinuddin Recent Advances in Biosensor Technology for Early-Stage Detection of Hepatocellular Carcinoma-Specific Biomarkers: An Overview, Diagnostics, **2024**, 14 (14), 1519
3. SI Wani, TA Mir, M Nakamura, T Tsuchiya, A Alzhrani, S Iwanaga, K Arai, EA Alshehri, T Shamma, D A Obeid, **R Chinnappan**, A M Assiri, A Yaqinuddin, Y K Vashist, D C Broering. A review of current state-of-the-art materiobiology and technological approaches for liver tissue engineering. Bioprinting, **2024**, e00355
4. P Nisha, RM Shahma, S Devanesan, TA Mir, **R Chinnappan**, MS AlSalhi, T Alzahim. Development of highly porous seaweed impregnated facemask substrates for protecting people from microbial hazards. Environmental Technology & Innovation, **2024**, 36, 103764
5. L Ramachandran, F Abul Rub, A Hajja, I Alodhaibi, M Arai, M Alfuwais, T. Makhzoum, A.Yaqinuddin, K. Al-Kattan, A. M Assiri, D. C Broering, **R. Chinnappan**, T. Mir, N. K. Mani, Biosensing of Alpha-Fetoprotein: A Key Direction toward the Early Detection and Management of Hepatocellular Carcinoma, Biosensors, **2024**, 14 (5), 235

6. T El Hayek, OA Alnaser-Almusa, SM Alsalameh, MT Alhalabi, AN Sabbah, E. Alshehri, T. Mir, N. K. Mani, K. Al-Kattan, **R. Chinnappan**, A. Yaqinuddin, Emerging role of exosomal microRNA in liver cancer in the era of precision medicine; potential and challenges Frontiers in Molecular Biosciences, **2024,** 11, 1381789.
7. A Jabri, J Khan, B Taftafa, M Alsharif, A Mhannayeh, **R Chinnappan**, AAlz. hrani, S. Kazmi, M. Mir, A. Alsaud, A. Yaqinuddin, A. Assiri, K. AlKattan, Y. K Vashist, D. Broering, T. Mir. Bioengineered Organoids Offer New Possibilities for Liver Cancer Studies: A Review of Key Milestones and Challenges. Bioengineering **2024,** 2011 (4), 346
8. S. Alhogaila, **R. Chinnappan**, A.R.Y. Suaifan, K.M. Abu-Salah, K. Al-Kattan , D. Cialla-May, Popp Jürgen, M. Zourob, Rapid Colorimetric Quantitative portable platform for Detection of Brucella melitensis based on Fluorescent Resonance Energy Transfer Assay and Nanomagnetic particles ACS omega, **2024**, 9 (19), 20997-21005
9. I. Uttam, S. Sudarsan, R. Ray, **R. Chinnappan**, A. Yaqinuddin, K. Kattan, N.K. Mani Concentrating microbes from Human Urine samples using Paper-based Adsorbents for Point-of-Care Molecular Assays, Life **2024**, 14, 38
10. A. Narasimhan, H. Jain, K. Muniandy, **R. Chinnappan**, N.K. Mani, Bio‑analysis of Saliva Using Paper Devices and Colorimetric Assays, J. Anal. Test, **2024**, 8,114
11. S. Sudarsan, P. Shetty, **R. Chinnappan**, N, Mani: Tuning hydrophobicity of paper substrated for effective detection of Glucose and Nucleic Acid Assay on Paper Substrates, Anal. Bio. Anal. Chem. **2023,** 415, 6449.
12. **R. Chinnappan**, T.Mir, S. Alsalameh, T. Makhzoum, A. Alzhrani, K. Kattan, A. Yaqinuddin Low-cost point-of-care monitoring of ALT and AST is promising for faster decision-making and diagnosis of acute liver injury, Diagnostics, **2023**, 13, 2967
13. **R. Chinnappan**, T.Mir, S. Alsalameh, T. Makhzoum, A. Alzhrani, K. Alnajjar, S.Adeeb, N. Eman, Z. Ahmed, I. Shakir, K. Kattan, A. Yaqinuddin, Emerging biosensing methods to monitor lung cancer biomarkers in biological samples: A comprehensive review, Cancers **2023**, 13, 3414.
14. **R. Chinnappan**, T. Mir, S. Alsalameh, T. Makhzoum, S. Adeeb, K. AlKattan and A. Yaqinuddin, Aptasensors Are Conjectured as Promising ALT and AST Diagnostic Tools for the Early Diagnosis of Acute Liver Injury, Life **2023**, 13, 1273.
15. **R. Chinnappan**, Q. Ramadan and M. Zourob, Isolation and detection of exsosomal Mir210 using carbon nanomaterial-coated magnetic beads, J. Funct. Biomat., **2023,** 14, 441.
16. **R. Chinnappan**, Qasem. R, M. Zourob, An integrated lab-on-a-chip platform for pre-concentration and detection of colorectal cancer exosomes using anti-CD63 aptamer as a recognition, Biosen. Bioelectron. **2023**, 220, 114856.
17. S Alsalameh, K Alnajjar, T Makhzoum, N Al Eman, I Shakir, TA Mir, K Alkattan, **R Chinnappan,** A. Yaquinuddin. Advances in Biosensing Technologies for Diagnosis of COVID-19. Biosensors, **2022**, 12, 898.
18. N Alomran, **R Chinnappan,** J Alsolaiss, NR Casewell, M Zourob. Exploring the Utility of ssDNA Aptamers Directed against Snake Venom Toxins as New Therapeutics for Snakebite Envenoming. **2022**, Toxins 14 (7), 469

19. M. Alnajrani, M. Aljohani, **R. Chinnappan**, M. Zourob, O.Alsager. Highly sensitive and selective lateral flow aptasensor for anti-coagulant dabigatran etexilate determination in blood, **2022**, Talanta, 236, 122887.
20. N Alomran, **R Chinnappan,** J Alsolaiss, NR Casewell, M Zourob. Exploring the utility of ssDNA aptamers directed against snake venom toxins as new therapeutics for tropical snakebite envenoming**. 2022**, BioRxiv. Doi: https://doi.org/10.1101/2022.05.22.492967
21. M. Aljohani, D. Cialla-May, J. Popp, **R. Chinnappan**, K. Al-Kattan, M. Zourob Aptamers: Potential Diagnostic and Therapeutic Agents for Blood Diseases. Molecules, **2022**, 27, 383.
22. FA. Azri, J. Selamat, R. Sukor, NA Yusof, NHA Raston, S. Eissa, M. Zourob, **R. Chinnappan.** Determination of minimal sequence for zearalenone aptamer by computational docking and application on an indirect competitive electrochemical aptasensor, Analytical and bioanalytical chemistry, **2021**, 413, 15, 3861-3872
23. M. Raji, **R. Chinnappan**, A Shibl, G Suaifan, K Weber, D Cialla-May, J Popp, EE Shorbagy, K Al-Kattan, M. Zourob. Low-cost colorimetric diagnostic screening assay for methicillin resistant Staphylococcus aureus. Talanta, **2021**, 225, 121946
24. HA. Alhadrami#, AM. Hassan, **R. Chinnappan**#, HA. Alhadrami W.H Abdulaal, E.I, Azhar and M.Zourob. Peptide substrate screening for the diagnosis of SARS-CoV-2 using fluorescence resonance energy transfer (FRET) assay, Microchemica Acta, **2021**, 88, 4.
25. **R. Chinnappan**, N.Zaghloul, R. AlZabn, A. Malkawi, A.A.Rahman, K.M Abu-Salah, M. Zourob. Aptamer selection and aptasensor construction for bone density biomarkers. Talanta. **2021**, 224, 121818.
26. S.Alhogail, **R. Chinnappan**, M. Alrifai, GARY. Suaifan, FJ. Bikker, W E. Kaman, K. Weber, D. Cialla-May, J. Popp, M B. Alfageeh, K Al-Kattan, M. Zourob. Simple and rapid peptide nanoprobe biosensor for the detection of Legionellaceae. Analyst, **2021**, 146, 11, 3568-3577.
27. **Chinnappan. R**, Alzabn . R, Fataftah . A, Alhoshani. A, Zourob. M. Probing high-affinity aptamer binding region and establishment of aptasensor platform for cylindropermopsin detection. Analytical and bioanalytical Chemistry, **2020** 412:4691–4701.
28. M.M. Aljohani, ***R. Chinnappan***, O. A Alsager, R AlZabn, A Alhoshani , K. Weber, D Cialla-May, J Popp, M. Zourob **Mapping the Binding Region of Aptamer Targeting small molecule: Dabigatran Etexilate, an Anti-Coagulant. Talanta, 2020, 218. 121132.**
29. Alhadrami. H, Al-Amer. S, Aloraij. Y, Alhamlan. F, **Chinnappan. R**, Abu-Salah. K, Almatrrouk. S, Zourob. M.. Development of Simple, fast and cost-effective nano-based immunoassay method for detecting norovirus in food samples. ACS Omega**, 2020** 21, 12162.
30. Azri, F.A., Eissa, S., Zourob, M. **R, Chinnappan**, R. Sukor, N.A Yousf, NHA Raston, A,Alhoshani, S. Jinap . Electrochemical determination of zearalenone using a label-free competitive aptasensor. *Microchim Acta* , **2020** 187, 266.*)*
31. S. Eissa, S. Alkhaldi, **R. Chinnappan#,** A. Siddiqua M. Abduljabbar A. M. Abdel Rahman, M. Dasouki M. ZourobSelection, Characterization, and electrochemical biosensing application of DNA aptamers for sepiapterin. Talanta. **2020,** 216, 120951

32. **R.Chinnappan**. A. Rahamn, R. AlZabn S. Kamath, A. L. Lopata, K M. Abu-Salah, M Zourob, Aptameric biosensor for the sensitive detection of major shrimp allergen, tropomyosin, Food Chemistry. **2020**, 314, 126133.*)*

33. **R. Chinnappan**, S. Eissa, A. Alotaibi, A. Siddiqua, O. Alsager, M. Zourob. In vitro selection of DNA aptamers and their integration in a competitive voltammetric biosensor for azlocillin determination in wastewater, Analytica Chimica Acta. **2020**, 1101, 149-156.

34. **R Chinnappan,** A Al Faraj, AM Abdel Rahman, KM Abu-Salah, F Mouffouk, M. Zourob. Anti-VCAM-1 and AntIL4Rα Aptamer-Conjugated Super Paramagnetic Iron Oxide nanoparticles for Enhanced Breast cancer Diagnosis and Therapy. Molecules. **2020** 25, 3437

35. S. Eissa, A. Siddiqua, **R. Chinnappan**, and M. Zourob, Electrochemical SELEX protocol for selecting DNA aptamer against dedicator of cytokinesis 8 and its biosensing application, **2019** Micro.Chem. Acta, 186 (12), 828

36. Khalil A Roointan, T.A. Mir, S.I. Wani, K. Hussain, B. Ahmed, S. Abrahim, A. Savardashtaki, G. Gandomani, M.Gandomani, **R. Chinnappan**, M. H Akhtar, Early detection of lung cancer biomarkers through biosensor technology: A review. J.Pharm. Biomed. Anal, **2019**, 164, 93.

37. **R Chinnappan**, R. Mohammed, A Yaqinuddin, K. Abu-Salah, M Zourob, *Highly sensitive multiplex detection of microRNA by competitive DNA strand displacement fluorescence assay*. Talanta, **2019,** 200, 487-493

38. **R Chinnappan**, R AlZabn, KM Abu-Salah, M Zourob. An aptamer based fluorometric microcystin-LR assay using DNA strand-based competitive displacement, Microchimica Acta, **2019**, 186 (7), 435.

39. **R Chinnappan**, R AlZabn, TA Mir, M Bader, M Zourob. Fluorometric determination of okadaic acid using a truncated aptamer, Microchimica Acta, **2019**, 186 (7), 406

40. S Eissa, A Siddiqua, **R Chinnappan**, M Zourob. Electrochemical SELEX technique for the selection of DNA aptamers against the small molecule 11-deoxycortisol. ACS Applied Bio Materials **2019**, 2,6, 2624-2632.

41. **R Chinnappan,** MM Aljohani, S Eissa, OA Alsager, K Weber, D Cialla-May, M.Zourob, In Vitro Selection of Specific DNA Aptamers Against the Anti-Coagulant, Dabigatran Etexilate, Scientific Reports **2018**, 8 (1), 13290.*)*

42. S Alamer, S Eissa, **R Chinnappan,** P Herron, M Zourob; Rapid colorimetric lactoferrin-based sandwich immunoassay on cotton swabs for the detection of foodborne pathogenic bacteria, Talanta, **2018**,185, 275-280

43. M. AlJohani, **R. Chinnappan**, S. Eissa, T. Owaidah, D. Cialla-Mayc, J. Poppc, M.Zourob. Development of Novel Nanobiosensor for Direct Measurement of the Oral Anticoagulant Agent: Dabigatran Etexilate. Blood, **2018**, 132 (Suppl 1), 1247-1247

44. S Alamer, S Eissa, **R Chinnappan,** M Zourob, A rapid colorimetric immunoassay for the detection of pathogenic bacteria on poultry processing plants using cotton swabs and nanobeads., Microchimica Acta, **2018,** 185 (3), 164

45. **R Chinnappan,** S AlAmer, S Eissa, AA Rahamn, KMA Salah, M Zourob, Fluorometric graphene oxide-based detection of Salmonella enteritis using a truncated DNA aptamer. Microchimica Acta. **2018**,185 (1), 61.*)*

46. S Eissa, **R Chinnappan,** M Zourob, Advances in Biosensor Technologies for Food Allergen Monitoring and Diagnosis, Food Allergy: Methods of Detection and Clinical Studies. **2017**.

47. S Eissa, **R Chinnappan,** M Zourob,Ultrasensitive Label-free Electrochemical Immunosensors for Multiple Cell Surface Biomarkers on Liver Cancer Stem Cells, **2017,** Electroanalysis 29 (8), 1994-2000.

48. **R Chinnappan** HA Alhadrami, S Eissa, AA Rahamn, M Zourob. High affinity truncated DNA aptamers for the development of fluorescence based progesterone biosensors, Anal. Biochem. **2017,** 525, 78-84.

49. **R Chinnappan**, S Al Attas, WE Kaman, FJ Bikker, M Zourob,Development of magnetic nanoparticle based calorimetric assay for the detection of bovine mastitis in cow milk. Anal.Biochem. **2017,** 523, 58-64

50. S Eissa, **R Chinnappan**, M Zourob. Label-free impedimetric immunosensors for liver cancer stem cells. Procedia Tech. **2017,** 27, 287-289

51. S.Alamer, **R. Chinnappan**, M. Zourob; Development of rapid immuno-based nanosensors for the detection of pathogenic bacteria in poultry processing plants, Procedia Tech. **2017** 27, 23-26

52. **R.Chinnappan**, A.Dubé, J-F.Lemay, D.Lafontaine. Fluorescence monitoring of riboswitch transcription regulation using a dual molecular beacon assay, Nucl. Acid. Res. **2013**, 41, e106

53. R. Chinnappan, A, Ng, S.Eissa, H.Liu, C. Tlili, M. Zourob, Highly sensitive aptamer based biosensor for microcystin detection, *Envi. Sci. Tech.* **2012**, 46,

54. A. Mazhorova, A. Markov, A. Ng, **R. Chinnappan**, M. Zourob, and M. Skorobogatiy Label-free bacteria detection using evanescent mode of a suspended core terahertz fiber, *Opt. Exp*. **2012**, 20, 5344.

55. W.J.Bock, P. Mikulic, **R.Chinnappan**, A. Ng, M.Tolba and M.Zourob, Long period grating based biosensor for the detection of *Escherichia coli* bacteria, S. M.Tripathi, *Biosen. Bioele.* **2012**, 35, 308.

56. S. Mateusz, W.J.Bock, P. Mikulic, **R. Chinnappan**, A. Ng, M. Tolba and M. Zourob, Detection of bacteria using bacteriophages as recognition elements immobilized on long-period fiber gratings, *Opt. Exp*. **2011**, 19, 7971.

57. S.Blouin**, R. Chinnappan**, and D. A. Lafontaine. Folding of the lysine riboswitch: importance of peripheral elements for transcriptional regulation. *Nucl. Acid. Res*. **2011**, 39, 3373.

58. **R. Chinnappan** , C.Lin, K. Acharya, J.L. Pellequer, R. Jankowiak. On stabilization of a neutral aromatic ligand by π–cation interactions in monoclonal antibodies. *Biophys. Chem.* **2011**, 154, 35.

59. B. Ilien, N. Glasser, J.P.Clamme, P. Didier, E. Piemont**, R. Chinnappan**, S.B Daval, J.L Galzi, Y. Mely. Pirenzepine promotes the dimerization of muscarinic M1 receptors through a three-step binding process, *J. Biol Chem.***2009**, 284, 19533.

60. J. Dietz, J. Koch, A. Kaur, **R. Chinnappan,** S. Stein, M.l Grez, A. Pustowka, S. Mensch, J. Ferner, R. Tampé, G. Divita, Y. Mély, H. Schwalbe & U. Dietrich. Inhibition of HIV-1 by a peptide ligand of the genomic RNA packaging signal Psi, *ChemMedChem.* **2008**, 3,749. .

61. **R. Chinnapan**[#], B. Miksa[#], N. Dang, M. Reppert, N. Tretyakova, N. M.Grubor and R Jankowiak. Spectral Differentiation and Immunoaffinity Capillary Electrophoresis Separation of Enantiomeric Benzo(a)pyrene Diol Epoxide-Derived DNA Adducts. *Chem. Res. Toxicol.* **2007**, 20, 1192.

62. **R.Chinnappan**, J Ferner, U. Dietrich, S. Avilov,D. Ficheux, J.L Darlix, H. de Rocquigny, H. Schwalbe, and Y. Me´ly, A Tryptophan-Rich Hexapeptide Inhibits Nucleic Acid Destabilization Chaperoned by the HIV-1 Nucleocapsid Protein. *Biochemistry.* **2006**, 45, 9254.

63. G.Julien, De R. Hugues, **R. Chinnappan**, G. Nicole, F. Damien, D.Jean-Luc, Y. Mely. During the early phase of HIV-1 DNA synthesis, nucleiocapsid protein directs hybridization of the TAR complementary sequences via the ends of their double-stranded stem. *J. Mol. Bio.* **2006**, 356, 1180.

64. **R. Chinnappan,** K. Ananthanarayanan and P. Natarajan. Studies on the photophysical characteristics of poly(carboxylic acid)s bound protoporphyrin IX and metal complexes of protoporphyrin IX. *Eur. Polym, J.* **2006**, 42, 495.

65. P. Natarajan and **R. Chinnappan**, Studies on the dynamics of poly(carboxylic acids) with covalently bound thionine and phenosafranine in dilute aqueous solutions, *Eur. Polym, J.* **2005**, 41, 2496.

66. P. Natarajan and **R. Chinnappan,** Studies on interpolymer self-organisation behaviour of protoporphyrin IX bound poly(carboxylic acid)s with complimentary polymers by means of fluorescence techniques. *Eur. Polym, J.* **2004**, 40, 2291.

67. P.Natarajan and **R.Chinnappan,** Novel features of the interpolymer self-organisation behaviour investigated using covalently linked protoporphyrin IX as fluorescent probe in the macromolecules. *Eur. Polym. J.* **2001**, 37, 2207.

## Research Funding

1. **SIDACTION** Postdoctoral Research Grand, Paris, France- 2004

2. IRG Research Grand ( PI) 2016, Alfaisal University, Kingdom of Saudi Arabia

3. IRG Research Grand ( PI) 2018, Alfaisal University, Kingdom of Saudi Arabia

4. Al Queel Liver Disease Fund ( Co-PI) 2023, KSA

## Recent Seminars and Conferences

1. Invited Talk: Nanomaterial in Sensing Technology workshop- presented the research work in University sains Malaysia, Penang, **Malaysia** July 2018

2. Invited Talk: Aptamer Selection workshop University Sains Malaysia, Kota Bharu, **Malaysia**, October 2018

**Previous Employment**

**Research and Development Chemist,** Carmel Industries Inc, **Canada** 2012 - 2014

- Formulation and production of solvent and aqueous-based paints
- Formulation of inks for permanent and temporary markers
- Developed new formula solid paint crayons for industrial applications
- Preparation of livestock markers and paint markers
- Prepared MSDS for the new products

**Research Scientist,** GDG Environment Ltd and INRS, Varennes, **Canada** *2010 - 2012*

- Set up a new research and development laboratory for GDG Environment Ltd.
- Microcystin target molecules are bioconjugated on the sepharose beads and the activity of immobilized microcystins was estimated using phosphatase enzymatic assay.
- The high-affinity aptamers were selected by the SELEX. The bound aptamers were separated and PCR amplified.
- PCR products of the DNA aptamers from final rounds were cloned into pCR2.1-TOPO vector using TOPO TA cloning kit. The ssDNA inserts were amplified and sequenced.
- The dissociation constant of the aptamers for their corresponding targets was determined by the titration method.
- Cultured E.Coli bacteria and T4 bacteriophage for the development of labelle free E.coli detection by optical methods.

**Senior Research Associate,** *Sherbrooke University, Sherbrooke,* **Canada** *2007-2010*

- Developed a fluorescence-based follow-up for the riboswitch transcription-controlled gene expression in real-time
- The DNA template of the RNA riboswitch was ligated into the DNA plasmid and study the riboswitch functions in-vivo.
- Used single-round transcription assay for the study of riboswitch activities using $p^{32}$ radio-labeled nucleotides.
- Carried out Selective 2'Hydroxyl Acylation analyzed by the Primer Extension (SHAPE) for determination of RNA secondary and tertiary structures.
- HPLC was used for the purification of homemade fluorescently labeled oligonucleotides

**Research Associate,** *Kansas State University,* **USA** *2006 - 2007*

- Purified different types of monoclonal antibodies using the protein-A/G gel-packed affinity column chromatography.
- Used advanced KrF excimer and tunable dye laser instruments and carried out the experiments at cryogenic conditions ( liquid helium, 4K, -269˚C)
- The difference in the affinity constants of isomers of benzo(a)pyrene diol epoxide DNA adducts and antibody immunocomplexes were differentiated using the high-resolution fluorescence line narrowing spectroscopy (FLNS) at cryogenic condition (4K)
- Immunoaffinity capillary electrophoretic separation of isomers of benzo(a)pyrene diol epoxide DNA adducts was achieved
- Experimentally proved the stabilization of the immunocomplexes of aromatic ligands and the antibodies stabilized by the Pi-Cation interactions using FLNS spectroscopy.

**Postdoctoral Research Fellow,** *Chemnitz University of Technology,* **Germany** *2005*

- Variation of optical properties of the quantum dot nanoparticles with size distribution.
- photoluminescent blinking of QDs was studied using confocal and wild-field fluorescence microscopes.
- Influence of organic molecular interaction of the photoluminescence properties of quantum dot nanoparticles.

**Postdoctoral Research Fellow,** *Louis-Pasteur University, Strasburg,* **France***2003 - 2004*

- Inhibition of HIV-1 nucleocapsid (NCp) protein chaperone activity by small peptides
- Characterization (UV-Vis, fluorescence, pH study) of short peptides which inhibit NCp
- TAR and cTAR annealing kinetic pathways have been studied using real-time FRET
- DNA/RNA and protein binding studies
- Molecular mechanisms of Bodipy-pirenzepine binding to an enhanced green fluorescent protein (EGFP): fluorescence Single-photon counting study
- Peptide-siRNA binding interaction by in-situ tryptophan fluorescence

## EDUCATION

**Ph. D. Chemistry,** University of Madras, India 2004
*Thesis Title*: Studies on the dynamics of fluorophore-bound macromolecules and their self-organization behaviors in aqueous solutions.

**M. Sc. Chemistry**, University of Madras, India 1997
*Thesis Title*: Effect of solvent on the fluorescence properties of dimeric acridinedione dyes.

**B. Sc.** Chemistry, University of Madras, India 1995

## AWARDS, MERITS AND MEMBERSHIPS

- **SIDACTION** Postdoctoral fellowship award, France 2004

- Associate Member-American Association for Cancer Research Since 2006
- Internal Research Grand Award –Alfaisal University 2016
- Internal Research Grand Award –Alfaisal University 2018
- Research Excellence Award –Alfaisal University 2019
- Patent award -Alfaisal University 2020
- Patent award -Alfaisal University 2022
- Research Excellence Award –Alfaisal University 2023
- Al Queel Liver Disease Fund Award 2023