CURRICULUM VITAE

C. Gunanathan
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School of Chemical Sciences
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PROFESSIONAL EXPERIENCE

2013- **Reader F**
Ramanujan Fellow (DST, New Delhi)
School of Chemical Sciences
National Institute of Science Education and Research (NISER)
Bhubaneswar, India.

2011-2013 **Assistant Professor**
Ramanujan Fellow (DST, New Delhi)
School of Chemical Sciences, NISER, Bhubaneswar.

2009 – 2011 **Alexander von Humboldt Research Fellow**
Institut für Technische und Makromolekulare Chemie
RWTH Aachen University, Aachen, Germany.
Advisor: Prof. Walter Leitner

2006-2008 **Dean of Faculty Postdoctoral Fellow** (Feinberg Graduate School)
Department of Organic Chemistry & Department of Biological Regulation, Weizmann Institute of Science, Israel.
Advisors: Prof. David Milstein & Prof. Hadassa Degani

2005-2006 **Postdoctoral Fellow**
Department of Organic Chemistry & Department of Biological Regulation, Weizmann Institute of Science, Israel.
Advisors: Prof. David Milstein & Prof. Hadassa Degani

EDUCATION

2005, Ph. D **Chemistry**, Central Salt and Marine Chemicals Research Institute (CSIR), Bhavnagar, India. ***Thesis Title:*** *Studies on Tandem Reactions of a-Diazo Ketones Using Transition Metal Catalysts Towards the Synthesis of Polycyclic Systems.*
Advisor: Prof. S. Muthusamy

1999, M. Sc **Organic Chemistry** (Specialization), Department of Organic Chemistry, University of Madras, Chennai, India.

1997, B. Sc **Chemistry,** R. K. M. Vivekananda College (University of Madras), Mylapore, Chennai, India.

AWARDS/FELLOWSHIPS/CREDITS

- *h-Index 21* in July 2014.
- *Ramanujan Fellowship* (Sept. 2011-). Department of Science and Technology, New Delhi. Availed at NISER, Bhubaneswar-751 005, India.
- *Alexander von Humboldt Research Fellowship* (March 2009-April 2011). RWTH Aachen University, Aachen, Germany.
- *Dean of Faculty Postdoctoral Fellowship* (July 2006 to Sept 2008) by Feinberg Graduate School, Weizmann Institute of Science, Israel.
- *Research report selected by Science* among the top 10 major scientific breakthroughs of the year 2007 (discovery of a new reaction).
- *Research work highlighted in* CE&N (2011 & 2007-News of the week & highlights of the year), Science News (2007 & 2008) and RSC Chemistry World (2008), Nature Chemistry (2011) and several other print and electronic media.
- *Postdoctoral Fellowship* (March 2005 to June 2006) by Department of Organic Chemistry, Weizmann Institute of Science, Israel.
- *Senior Research Fellowship* (Oct' 2002 to Feb' 2005) by Council of Scientific and Industrial Research (CSIR), New Delhi, India.
- *Junior Research Fellowship* (Nov' 1999 to Oct' 2002) by Central Salt and Marine Chemicals Research Institute (CSMCRI, CSIR), Bhavnagar, India.
- *CSIR-National Eligibility Test*-Lectureship (NET-1999) – qualified.
- *Graduate Aptitude Test in Engineering* (GATE-1999) – qualified.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Chemical Research Society of India (**CRSI**): Life member.
Israel Chemical Society (**ICS**): Annual member (since 2006).
German Catalysis Society (**GECATS**): Annual member (since 2010).
Catalysis Society of India (**CSI**): Life member.

COURSES TEACHING

C341: Organic Chemistry Lab I
C142: Chemistry Lab II
C566: Catalysis: Reaction Mechanism and Applications

PERSONAL INFORMATION:

Date of Birth	: June 05, 1977
Sex	: Male
Nationality	: Indian
Martial Status	: Married
Languages Known	: English, Tamil, Guajarati, and Hindi

COMMERCIALIZED PRODUCTS

03. **Milstein Acridine Catalyst: (A-^{i}Pr-PNP)RuHCl(CO) [2011]**
CAS No: 1101230-25-4; Commercially available from Strem Chemicals, USA.
Contribution: Designed and developed a synthetic procedure and catalytic applications.

02. **Acridine Pincer Ligand (A-^{i}Pr-PNP):** 4,5-bis-(diisopropylphosphinomethyl)acridine. **[2011]** CAS No: 1101230-28-7; Commercially available from Strem Chemicals, USA.
Contribution: Designed and developed a synthetic procedure.

01. **Milstein Catalyst. [2009]**
CAS No: 863971-62-4. Commercially available from Strem Chemicals, USA.
Contribution: Developed a modified procedure with enhanced yields.

LIST OF PUBLICATIOS

REVIEWS (Invited)

50. **Gunanathan, C**.; Milstein, D. *Bond Activation and Catalysis by Ruthenium Pincer Complexes.*
Chem. Rev. 2014, *114*, 12024−12087.

49. **Gunanathan, C**.; Milstein, D. *Applications of Acceptorless Dehydrogenation and Related Transformations in Chemical Synthesis.*
Science 2013, *341*, 249. (DOI: 10.1126/ science.1229712)

48. **Gunanathan, C**.; Milstein, D. *Metal−Ligand Cooperation by Aromatization−Dearomatization: A New Paradigm in Bond Activation and "Green" Catalysis.*
Acc. Chem. Res. 2011, *44*, 588-602.

BOOK CHAPTERS (Invited)

47. **Gunanathan, C**.; Milstein, D.
Catalysis by Pincer Complexes: Synthesis of Esters, Amides, and Peptides
Szabó, K. J.; Wendt, O. F. (Eds). *Pincer and Pincer-Type Complexes: Applications in Organic Synthesis and Catalysis*, First Edition. Wiley-VCH. Weinheim (2014) pp. 1-30.

46. **Gunanathan, C**.; Milstein, D.
Bond Activation by Metal-Ligand Cooperation: Design of "Green" Catalytic Reactions Based on Aromatization-Dearomatization of Pincer Complexes.

Ikariya, T.; Masakatsu, S. (Eds). *Chemistry of Bifunctional Molecular Catalysis.* Springer. Berlin (2011) pp. 55-84.

45. **Gunanathan, C**.; Milstein, D.
Ruthenium, [6-[[Bis(1,1-dimethylethyl)phosphino-κP]methylene]-N,N-diethyl-1,6-dihydro-2-pyridinemethanaminato-κN1,κN2]carbonylhydride.
e-Encyclopedia of Reagents for Organic Synthesis. John Wiley & Sons, Ltd. 2009.

PATENTS

44. Milstein, D.; Balaraman. E; **Gunanathan, C**.; Gnanaprakasam. B.; Zhang. J
Novel ruthenium catalysts and their uses in processes for formation and/or hydrogenation of esters, amides and derivatives thereof.
PCT Int. Patent. 2012, Patent No: WO 2012/052996A2 20120426

43. Milstein, D.; **Gunanathan, C**.
Preparation of ruthenium complexes with quinolinyl or acridinyl based pincer ligands for use as catalysts in the process for preparing amines from alcohols and ammonia.
PCT Int. Patent. 2010, Patent No: WO 2010/018570 A1.
U.S. Patent, 2014, Patent. No.: 20,140,288,306

42. Milstein, D.; **Gunanathan, C**.; Ben-David, Y.
Process for the preparation of amides by reaction of amines with alcohols.
U.S. Patent, 2009, Patent. No.: US 8178723B2 (2009/0112005 A1).
U.S. Patent, 2012, Patent. No.: US 8178723B2 (2009/0112005 A1).

RESEARCH REPORTS

41. Conifer, C.; **Gunanathan, C.**; Rinesch, T.; Hölscher, M.; Leitner, W. *Solvent-Free Hydrosilylation of Terminal Alkynes by Reaction with a Nonclassical Ruthenium Hydride Pincer Complex.*
Eur. J. Inorg. Chem. Article ASAP. DOI: 10.1002/ejic.201403016.

40. Chatterjee, B.; **Gunanathan, C.** *Ruthenium Catalyzed Selective Hydrosilylation of Aldehydes.*
Chem. Commun., 2014, *50*, 888-890.

39. **Gunanathan, C.**; Capelli, S. C.; Englert, U.; Hölscher, M.; Pan, F.; Leitner, W.
Structures and Dynamics of the Mixed Dihydrogen/Hydride Complexes $[Ru(PCP)(H)(H_2)_n]$ (n = 1, 2) and $[Ru(PNP)(H)_2(H_2)]$.
Eur. J. Inorg. Chem. 2013, 5075-5080.

38. **Gunanathan, C.**; Hölscher, M.; Pan, F.; Leitner, W. *Ruthenium Catalyzed Hydroboration of Terminal Alkynes to Z-Vinylboronates.*
J. Am. Chem. Soc. 2012, *134*, 14349-14352.
Highlights:
1. ***Synfacts***, 2012, *8*, 1353.
2. Organic Chemistry Portal: http://www.organic chemistry.org/abstracts/lit3/776.shtm

37. Gnanaprakasam, B.; Balaraman, E.; **Gunanathan, C**.; Milstein, D. *Synthesis of polyamides from diols and diamines with liberation of H_2.*
J. Polym. Sci. A Polym. Chem. 2012, 50, 1755-1765.

36. Muthusamy, S.; Karikalan, T.; Gunanathan. C.; Suresh, E. *Rhodium Catalyzed Intermolecular Double C-Alkylation: A Method for the Synthesis of Tetraindoles and indolophanes.*
Tetrahedron, 2012, *68,* 1595-1565.

35. Pais, A.; **Gunanathan, C**.; Margalit, R.; Biton, I. E.; Yosepovich, A.; Milstein, D.; Degani, H. *In Vivo Magnetic Resonance Imaging of the Estrogen Receptor in an Orthotopic Model of Human Breast Cancer.*
Cancer Res. 2011, *71*, 7387–97.

34. Balaraman, E.; **Gunanathan, C**.; Zhang, J.; Shimon, L. J. W.; Milstein, D. *Efficient Hydrogenation of Organic Carbonates, Carbamates and Formates Indicates Alternative Routes to Methanol Based on CO_2 and CO.*
Nature Chem. 2011, *3*, 609-614.

Highlights: Nature Chem. 2011, *3*, 578-579.

Chemical & Engineering News (July 22, 2011),
http://pubs.acs.org/cen/news/89/i31/8931news3.html

33. **Gunanathan, C.**; Hölscher, M.; Leitner, W. *Reduction of Nitriles to Amines with H_2 Catalyzed by Nonclassical Ruthenium Hydrides–Water-Promoted Selectivity for Primary Amines and Mechanistic Investigations.*
Eur. J. Inorg. Chem. 2011. 3381-3386

32. Li, M.; Greenblatt, H. M.; Albeck, S.; Dym, O.; **Gunanathan, C**.; Milstein, D.; Degani, D.; Sussman, J. L. *Structure of EPTA-Eu/Estrogen Receptor Complex: The Basis for Designing a New Class of SERMs.*
J. Med. Chem. 2011, *54*, 3575-3580.

31. **Gunanathan, C**.; Gnanaprakasam, B.; Iron, M.; Leitus, G.; Shimon, L. J. W.; Milstein, D. *"Long Range" Metal-Ligand Cooperation in H_2 Activation and Ammonia-Promoted Hydride Transfer with a Ruthenium-Acridine Pincer Complex.*
J. Am. Chem. Soc. 2010, *132*, 14763-14765.

30. **Gunanathan, C**.; Diskin-Posner, Y.; Milstein, D. *Lanthanide-Organic Framework of a Rigid Bis-Gd Complex: Composed by Carbonate Ions Spacers.*
Crystal Growth & Design 2010, *10*, 4235–4239.

29. **Gunanathan, C**.; Shimon, L. J. W.; Milstein, D. *Ruthenium Pincer Complex Catalyzed Dehydrogenative Transformations of Alcohols to Acetals and Ester.*
J. Am. Chem. Soc. 2009, *131*, 3146-3147.

Highlights: ChemCatChem, 2009, *1*, 72-73.

28. **Gunanathan, C**.; Milstein, D. *Selective Synthesis of Primary Amines Directly from Alcohols and Ammonia.*

Angew. Chem. Int. Ed. 2008, *47*, 8661-8664.

Highlights:
Selected as "hot paper" by Editors, Angew. Chem. Int. Ed.

Synfacts, 2009*, 1*, 79.

Science News. Oct' 2008.
http://www.sciencedaily.com/releases/2008/10/081020093452.htm

Chemical Processing: *Catalyst simplifies amines production.*
http://www.chemicalprocessing.com/articles/2008/233.html

RSC Chemistry World: *A greener route to amines.*
http://www.rsc.org/chemistryworld/News/2008/October/22100802.asp

http://www.eurekalert.org/pub_releases/2008-10/w-ria102008.php

http://www.physorg.com/news143102411.html

http://chem8.org/viewthread-19979.html

27. **Gunanathan, C**.; Ben-David, Y.; Milstein, D. *Direct Synthesis of Amides from Alcohols and Amines with Liberation of* H_2.
Science 2007, *317*, 790-792.

Highlights:
BREAKTHROUGH OF THE YEAR: The Runners-Up.
Science 2007, *318*, 1844 -1849.

Highlights of the year 2007. *Chemical & Engineering News*, **2007**, *85* (52), 13-19.
http://pubs.acs.org/cen/coverstory/85/8552cover.html

News of the week. *Chemical & Engineering News*, 2007, *85* (33), 10.
http://pubs.acs.org/cen/news/85/i33/8533notw1.html.

Synform, 2007/06: Synstories, A68.

A-IMBN and Nature Asia Research.
http://www.natureasia.com/A-IMBN/article.php?id=2

Angew. Chem. Int. Ed. 2008, *47*, 1814 – 1818.

Faculty of 1000 Biology: http://www.f1000biology.com/article/id/1089316/evaluation

http://walkerma.wordpress.com/category/amide-bond-formation/

http://en.wikipedia.org/wiki/Amides

26. **Gunanathan, C**.; Pais, A.; Furman-Haran, E.; Seger, D.; Eyal, E.; Mukhopadhyay, S.; Ben-David, Y.; Leitus, G.; Cohen, H.; Vilan, A.; Degani, H.; Milstein, D. *Water-Soluble Contrast Agents Targeted at the Estrogen Receptor for Molecular Magnetic Resonance Imaging.*
Bioconjugate Chem. 2007, *18*, 1361-1365.

25. Raitsimring, A. M.; **Gunanathan, C**.; Potapov, A.; Efremenko, I.; Martin, J. M. L.; Milstein, D.; Goldfarb, D. *Gd^{3+} Complexes as Potential Spin Labels for High Field Pulsed EPR Distance Measurements.*

J. Am. Chem. Soc. 2007, 129, 14138-14139.
Highlights: Faculty of 1000 Biology:
http://www.f1000biology.com/article/id/1092573/evaluation

24. Muthusamy, S.; **Gunanathan, C**.; Nethaji, M. *Multicomponent Reactions of Diazoamides: Diastereoselective Synthesis of Mono- and Bis-Spirofurooxindoles.* **J. Org. Chem.** 2004, *69*, 5631-5637.

23. Muthusamy, S.; **Gunanathan, C**.; Suresh, E. *Regioselective Synthesis of mono- and bis-Decahydrobenzocarbazoles via Tandem Reactions of α–Diazo Ketones.* **Tetrahedron** 2004, *60*, 7885-7897.

22. Muthusamy, S.; **Gunanathan, C**.; Nethaji, M. *Stereoselective Epoxide Generation with Cyclic Rhodium Carbenoids: A New Access to Spiro-indolooxiranes.* **Synlett** 2004, 639-642.

21. Muthusamy, S.; **Gunanathan, C.** *Reactions of Cyclic Diazoamides: Convenient Synthesis of Dispirocyclic Cyclopropane Systems.* **Synlett** 2003, 1599-1602.

20. Muthusamy, S.; **Gunanathan, C.** *$Rh_2(OAc)_4$-Catalyzed Reactions of α-Diazoimides: A Simple and Novel Synthesis of Mono- and Bis(2,3-fused perhydrooxazol-4-one) Systems.* **Chem. Commun.** 2003, 440-441.

19. Muthusamy, S.; **Gunanathan, C.** *$Rh_2(OAc)_4$-Catalyzed Regioselective Intermolecular C–H Insertion Reactions: Novel Synthesis of 2-Pyrrol-3′-yloxindoles.* **Synlett** 2002, 1783-1786.

18. Muthusamy, S.; **Gunanathan, C.**; Babu, S. A. *Oxidative [3+2]-Cycloaddition Reactions of 1,3-Dicarbonyl Compounds to Exocyclic Alkenes: The Regiospecific Synthesis of Spirodihydrofurans.* **Synlett** 2002, 787-789.

17. Muthusamy, S.; **Gunanathan, C.**; Babu, S. A.; Suresh, E., Dastidar, P. *First Example of Regiospecific Intermolecular C-H Insertion Reactions of Cyclic Rhodium Carbenoids: Novel Synthesis of 3,3′-Indolyloxindoles.* **Chem. Commun.** 2002, 824-825.

16. Muthusamy, S.; **Gunanathan, C.**; Babu, S. A. *Rhodium(II) acetate Catalyzed Synthesis of Cyclic Enamides and Enamines via β-Hydride Elimination.* **Synthesis** 2002, 471-474.

15. Muthusamy, S.; **Gunanathan, C.**; Babu, S. A. *Novel Regioselective Synthesis of Decahydrobenzocarbazoles Using Rhodium Generated Carbonyl Ylides with Indoles.* **Tetrahedron Lett**. 2001, 42, 523-526. *Named as "Muthusamy Approach to Decahydrocarbazoles"*

14. **Gunanathan, C.** Spotlight: *Lithium Perchlorate/Diethyl Ether (LPDE).* **Synlett** 2002, 649-650.

13. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Ganguly, B.; Suresh, E.; Dastidar, P. *Tandem Cyclization-Cycloaddition of Rhodium Carbenoids: Stereoselective Synthesis of Epoxy-Bridged Tetrahydropyranone Ring Systems.* **J. Org. Chem.** 2002, 67, 8019-8033.

12. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *An Efficient and Novel Stereoselective Protocol for the Construction of Syn-Facially Bridged Norbornane Frameworks.*
Tetrahedron Lett. 2002, 43, 5981-5984.

11. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *Anomalous Behavior of Rh(II) Generated Carbonyl Ylides: Entry into Functionalized Spiro Dioxa-Bridged Polycyclic Frameworks.*
Tetrahedron Lett. 2002, 43, 3931-3934.

10. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Suresh, E.; Dastidar, P. *Generation and Cycloaddition Behaviour of Seven-Membered Ring Carbonyl Ylides: Application to the Construction of Fused Cyclooctanoid Ring Systems.*
Bull. Chem. Soc. Jpn. 2002, *75*, 801-811.

09. Muthusamy, S.; Babu, S. A.; **Gunanathan, C**. *Indium triflate: A Mild and Efficient Lewis Acid Catalyst for O-H Insertion Reaction of α-Diazo Ketones.*
Tetrahedron Lett. 2002, *43*, 3133-3136.

08. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *1,8-Diazabicyclo[5.4.0]undec-7-ene: A Powerful Catalyst for Michael Addition Reaction of β-keto Esters with Acrylates and Enones.*
Synth. Commun. 2002, 32, 3247-3254.

07. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Jasra, R. V. *A New and Mild Heterogeneous Catalytic Decomposition of α-Diazo Carbonyl Compounds Using Montmorillonite or Zeolite.*
Synlett 2002, 407-410.

06. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.***;* Jasra, R. V. *Amberlyst-15 Mediated Decompositon of α-Diazo Carbonyl Compounds.*
Tetrahedron Lett. 2001, *42*, 5113-5116.

05. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Suresh, E.; Dastidar, P.; Jasra, R. V. *Rhodium Generated Carbonyl Ylides with p-Quinones: Synthesis of Oxa-Polycyclic Systems.*
Tetrahedron 2001, *57*, 7009-7019.

04. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Suresh, E.; Dastidar, P. *Novel Intermolecular [3+2]-Cycloaddition Reaction of Carbonyl ylides with Fulvenes: Entry into the Tetracyclo[6.5.1.$0^{1,6}$.$0^{9,13}$]tetradecene Ring System.*
Synlett 2001, 1407-1410.

03. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *A Simple and Efficient Synthesis of Bicyclo[n.m.0]alkanediones*
Synth. Commun. 2001, *31*, 1205-1211.

02. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *Novel Chemoselective 1,3-Dipolar Cycloaddition Reaction of Rhodium Generated Carbonyl Ylides with Arylidenetetralones*.
Tetrahedron Lett. 2000, *41*, 8839-8842.

01. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.**; Suresh, E.; Dastidar, P.; Jasra, R. V. *Facile Syntheis of Oxatricyclic Systems with Various Ring Sizes and Substituents*.
Tetrahedron 2000, *56*, 6307-6318.

INVITED LECTURES

05. New Catalytic Reactions Based on Metal-Ligand Cooperation. School of Chemical Sciences, NISER Bhubaneswar, Jan.23, 2012.

04. Cooperative Pincer Complexes: New Paradigm in Homogeneous Catalysis. RWTH Aachen University, Aachen, Germany. Feb. 3, 2010

03. Direct Chemistry: Catalytic Functionalization of Alcohols. Central Salt and Marine Chemicals Research Institute, Bhavnagar, INDIA. Dec. 26, 2008.

02. Direct Synthesis of Amides from Alcohols and Amines with Liberation of H_2. 38th International Conference on Coordination Chemistry. Jerusalem, ISRAEL. July 20-25, 2008.

01. Ruthenium Pincer Complexes: Synthesis and Catalysis. School of Chemistry, Bharathidasan University, INDIA, Sept. 28, 2007.

CONFERENCE PAPERS/POSTERS

22. Sahoo, A. R. S.; **Gunanathan, C.** *Rhodium Catalyzed Synthesis of Cyclic Ketals and Diketals from Diazocarbonyl Compounds.* Indo-French Symposium on "Functional Metal-Organics: Applications in Materials and Catalysis", Feb 24 - 26, 2014. NISER, Bhubaneswar, India.

21. **Gunanathan, C.**; Hölscher, M.; Leitner, W. *Ruthenium Catalyzed Hydroboration of Terminal Alkynes to Z-Vinylboronates.* 15th CRSI-National Symposium in Chemistry, 7th CRSI- RSC Symposium in Chemistry, 31st Jan, 1-3 Feb' 2013. Banarus Hindu University, Varanasi, India.

20. **Gunanathan, C**.; Milstein, D. *"Long-Range" Metal-Ligand Cooperation in Ruthenium-Acridine Pincer Complexes: Bond Activation and Catalysis.* MTIC-XIV, University of Hyderabad, India. 10-13 December 2011.

19. Balaraman, E.; **Gunanathan, C**.; Milstein, D. *Catalytic Hydrogenation of CO_2 Derivatives to Methanol.* MTIC-XIV, University of Hyderabad, India. 10-13 Dec' 2011.

18. Pais, A.; **Gunanathan, C**.; Biton, I.; Margalit. R.; Degani, H.; Milstein, D. *In Vivo Dynamic Contrast Enhanced MRI of Novel Contrast Agents Targeted to the Estrogen Receptor.* International Society for Magnetic Resonance in Medicine (ISMRM), Canada. May 7-13, 2011.

17. Participated in the *ICIQ Summer School on Catalysis, ICIQ, Tarragona, Spain, 19-23 July 2010.*

16. **Gunanathan, C**.; Shimon, L. J. W.; Milstein, D. *Selective Synthesis of Primary Amines Directly from Alcohols and Ammonia. Second New Year Symposium, RWTH-Aachen University, Aachen, Germany. January 22, 2010.* Awarded 'Best poster' of the symposium.

15. **Gunanathan, C**.; Shimon, L. J. W.; Milstein, D. *Selective Synthesis of Primary Amines Directly from Alcohols and Ammonia.* 2nd *German-Indian Symposium* on "Frontiers of Chemistry", Universität Leipzig, Leipzig, Germany, September 16-19, 2009.

14. **Gunanathan, C**.; Shimon, L. J. W.; Milstein, D. *Selective Synthesis of Primary Amines Directly from Alcohols and Ammonia.* **Gordon Research Conference** on Organometallic Chemistry, Salve Regina University, Newport, RI, USA, July 12-17, 2009. Invited participation and poster.

13. **Gunanathan, C**.; Ben-David, Y.; Milstein, D. *Direct Synthesis of Amides from Alcohols and Amines with Liberation of* H_2. International Conference on Hydrogen and Hydrogen Storage Methods and Materials, IISc, Bangalore, INDIA, January 3-6, 2009.

12. **Gunanathan, C**.; Adi, P.; Milstein, D.; Li, M.; Sussman, J.; Degani, H. *Novel Selective Estrogen Receptor Modulators for Non–Invasive Molecular Imaging.* American Association for Cancer Research, Annual Meeting 2008, San diego, CA, USA. April 12-16, 2008.

11. **Gunanathan, C**.; Ben-David, Y.; Milstein, D. *Direct Synthesis of Amides from Alcohols and Amines with Liberation of* H_2. 73nd meeting of the Israel Chemical Society. Jerusalem, Israel. Feb' 5-6, 2008.

10. Pais, A.; **Gunanathan, C**.; Degani, H.; Milstein, D. *Molecular MRI of the estrogen receptor in human breast cancer cells.* International Society for Magnetic Resonance in Medicine (ISMRM), Canada. May 3-9, 2008

09. **Gunanathan, C**.; Adi, P.; Furman-Haran, E.; Seger, D.; Eyal, E.; Mukhopadhyay, S.; Ben-David, Y.; Degani, H.; Milstein, D. *Water-Soluble Contrast Agents Targeted at the Estrogen Receptor for Molecular MRI.* Dutch-Israel meetings on "Molecular Materials" Israel. Nov' 18-20, 2007.

08. **Gunanathan, C**.; Eyal, E.; Adi, P.; Seger, D.; Furman-Haran, E.; Mukhopadhyay, S.; Ben-David, Y.; Degani, H.; Milstein, D. *Novel Water-Soluble Contrast Agent for Molecular Magnetic Resonance Imaging: Targeting Estrogen Receptor.* Poster presented in 72nd meeting of the Israel Chemical Society. Israel. Feb' 6-7, 2007.

07. **Gunanathan, C**.; Eyal, E.; Adi, P.; Seger, D.; Furman-Haran, E.; Mukhopadhyay, S.; Ben-David, Y.; Degani, H.; Milstein, D. *Novel Contrast Agent for Molecular Magnetic Resonance Imaging: Targeting Estrogen Receptor.* Poster presented in Minerva Conference on "Advances and Trends in Organic Chemistry". Israel. Dec' 9-12, 2006. Israel.

06. **Gunanathan, C**.; Furman-Haran, E.; Seger, D.; Eyal, E.; Mukhopadhyay, S.; Ben-David, Y.; Degani, H.; Milstein, D. *Novel Contrast Agent for Molecular Magnetic Resonance Imaging: Targeting Estrogen Receptor.* Poster presented in 71st meeting of the Israel Chemical Society. Israel. Feb' 27-28, 2006.

05. Eyal, E. ; **Gunanathan, C**.; Furman, E.; Seger, D.; Margalit, R.; Kreizman, T.; Degani, H.; Milstein, D. *Molecular MR Imaging of the Estrogen Receptor using a Novel Contrast Agent.* Poster presented in Minerva-Germany Symposium: A Dive into Magnetic Resonance. Israel. Dec' 11-15, 2005.

04. Muthusamy, S.; **Gunanathan, C.** Convenient Synthesis of Spiro-cyclopropane Systems from Cyclic Rhodium Carbenoids. Poster presented in Sixth National Symposium in Chemistry, IIT-Kanpur, Kanpur, India. Feb' 6-8, 2004.

03. Muthusamy, S.; **Gunanathan, C.** *Intermolecular C–H Insertion Reactions of Cyclic Rhodium Carbenoids: Novel Synthesis of 3-Indol-3′-yloxindoles and 2-Pyrrol-3′-yloxindoles.* Poster presented in Fifth National Symposium in Chemistry, CLRI, Chennai, India. Feb' 7-9, 2003.

02. Muthusamy, S.; Babu, S. A.; **Gunanathan, C.** *Stereoselective approach to the epoxy-bridged tetrahydropyranone ring systems.* The Ramanbhai Foundation First International Symposium, Zydus Cadila, Ahmadabad, India. Jan' 23-24, 2003. Awarded 'Best poster' of the symposium.

01. **Gunanathan, C.**; Babu, S. A.; Muthusamy, S. *Studies on reactions of cyclic diazoamines, diazoamides and diazoimides in the presence of $Rh_2(OAc)_4$ catalyst.* Poster presented in Fourth National Symposium in Chemistry, NCL, Pune, India. Feb' 1-3, 2002.

Conferences Attended:

XVI NOST Conference, April 4-7, 2014, Agra, India
Ramanujan Fellows First Conclave, 4-6, May 2012, IISER Pune, India
Ramanujan Fellows Second Conclave, 13-14, December 2013, IISER Pune, India