Curriculum Vitae

Dr. B. Ramakrishna
Lecturer In Chemistry
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Objective:

To work in a most dynamic and challenging environment throughout my career where I can contribute my skills & experience for the growth of the organization while learning & enhance my knowledge continuously.

Present position: Assistant Professor in Chemistry- Govt. Degree College, Vempalli, Kadapa (Dt.), Andhra Pradesh. Date Of Joining: 25-08-2021

Education:

Post Doc **DSK-PDF, Indian Institute of Science, Bangalore**
Mentor: Professor S. Chandrasekaran **2015-2018**

Ph.D **University of Hyderabad, Hyderabad**
Ph.D. (Doctor of Philosophy) in Synthetic Organic Chemistry **2009-2015**
Dissertation title: ***"Synthesis and Application of Spiro-Cyclopropanecarboxylated sugars"***
Ph. D. Supervisor: **Dr. Perali Ramu Sridhar**

M.Sc **Sri Krishnadevaraya University, Anantapur.**
M. Sc. (Master of Science) in Organic Chemistry **2005-2007**
Cumulative marks obtained: 73% (First division).

B.Ed **Sri Viswavani College of Education, Nandyal, Kurnool**
B. Ed. (Bachelor of Education) with Physical science and Mathematics **2003-2005**
Cumulative marks obtained: 70% (First division)
Degree conferred by: Sri Krishnadevaraya University, Anantapur, Andhra Pradesh.

B.Sc **Govt. Arts College, Kadapa, Andhra Pradesh**
B. Sc. (Bachelor of Science) with Chemistry, Physics and Mathematics **2000-2003**
Cumulative marks obtained: 69% (First division)

Degree conferred by: Sri Venkateswara University, Tirupathi, Andhra Pradesh.

Fellowships/Awards:

- Qalified AP-SET-2017 in Chemical Sciences **2017**
- CSIR – Senior Research Fellowship(SRF) in Chemical Sciences from Council of Scientific and Industrial Research (CSIR), INDIA **2011-2014**
- CSIR – Junior Research Fellowship (JRF) in Chemical Sciences from Council of Scientific and Industrial Research (CSIR), INDIA **2009-2011**
- Invited to Shyama Prasad Mukherjee (SPM) Fellowship Test (For top 20% CSIR-JRF (NET) awardees) **2008**
- Qualified Graduate Aptitude Test in Engineering (GATE) in Chemical Sciences, a national level examination (Rank: 141) **2008**
- Secured Rank 3 in SKU PG-CET **2005**

Publications

1. A convenient synthesis of L-ribose from D-fructose. Ramu Sridhar Perali,***** Suresh Mandava, **Ramakrishna Bandi.** *Tetrahedron* **2011**, *67*, 4031-4035. **DOI:** 10.1016/j.tet.2011.04.012.
2. Ring-Contraction *vs* Ring-Expansion Reactions of Spiro-Cyclopropanecarboxylated Sugars. **Bandi Ramakrishna**, Perali Ramu Sridhar.* *Org. Lett.* **2013**, *15*, 4474-4477. **DOI:** 10.1021/ol402021e.
3. Stereoselective synthesis of 1,6-dioxaspirolactones from spiro-cyclopropanecarboxylated sugars: Total synthesis of dihydro-pyrenolide D. **Bandi Ramakrishna, Perali Ramu Sridhar.*** *RSC adv.*, **2015**, *5*, 8142-8145. **DOI:** 10.1039/c4ra16753h.
4. Synthesis of β-*C*-Glyco Amino-acids by ring opening of donor-acceptor spiro-cyclopropanecarboxylated sugars. **Bandi Ramakrishna**, Chalapala Sudharani, Perali Ramu Sridhar.* *Israel Journal of Chemistry* **2016**, *56*, 558-565. **DOI:** 10.1002/ijch.201500087.
5. A Convenient Synthesis of Carbohydrate derived Furo/Pyarano[2,3-*b*]pyrans from 2-hydroxymethyl glycals. Chalapala Sudharani, **Bandi Ramakrishna,** B. C. Venkatesh, Perali Ramu Sridhar.* *Tetrahedron* **2017,** 73, 3923-3931. **DOI:** 10.1016/j.tet.2017.05.069.

6. 2-Deoxyglycosyl 3-benzoylpropionates as novel donors for the direct and stereo-selective synthesis of 2-deoxyglycosides. **Bandi Ramakrishna**, Chalapala Sudharani, Sreinivasan Chandrasekaran.* *Org. Biomol. Chem*. **2018**, *16*, 2248-2257. **DOI:** 10.1039/C8OB00216A.

Research Interests:

- Synthetic Organic Chemistry
- Glycosynthesis/Glycobiology
- Medicinal Chemistry
- Transition Metal Catalysis/Organocatalysis

Symposia Attended:

- **9th Junior National Organic Symposium Trust (J-NOST) conference,** held in December, **2013**, Indian Institute of Science Education and Research (IISER), Bhopal, India (***Poster presentation***).
- **Chemfest-2014**, held in February, 2014, School of Chemistry, *University of Hyderabad*, Hyderabad, India (***Speaker***).
- **27th International Carbohydrate Symposium (ICS-27)**, held in January, 2014, *Indian Institute of Science*, Bangalore, India (***Participation***).
- **1st Indo-Taiwan international symposium** held in November 17-18, 2014, University of Hyderabad. Hyderabad. (***Poster presentation***).

Research Skills:

Synthesis:

- Trained in
    - Development of novel synthetic organic methodologies.
    - Target-oriented multi-step organic synthesis.
    - Performing cryogenic reactions, handling of air, moisture sensitive reagents and reactions.
    - Carrying out organic transformations on milligram to multigram scale.
    - Purification techniques such as distillation, column chromatography, HPLC, crystallization and sublimation.

- Characterization of organic compounds using spectroscopic techniques ^{1}H, ^{13}C NMR, 2D NMR (COSY, NOESY), Mass and IR.

Equipment Operation and Handling:

- Received hands-on training in operating IR (*JASCO FT-IR 410*), UV and NMR (*BRUKER AVANCE 400 and 500*) spectrometers.

Software Usage:

- Well-versed with chemistry related software packages (such as Chem Draw, ISIS Draw and CS Chem Office), Molecular visualization tools (such as Mercury and Diamond) and graphing software (origin).
- Regular user of data bases such as Scifinder Scholar, Scopus and Reaxys.

Personal Details:

Date of Birth	:	06th June1983
Nationality	:	Indian
Gender	:	Male
Marital Status	:	Married
Languages known	:	English, Hindi, Telugu

References:

Prof. S. Chandrasekaran, F.N.A., F. A. Sc
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Research Summary of Ph.D. work

My doctoral work mainly describes the synthesis of sugar derived spiro-cyclopropanated sugars and applications in the synthesis of *C*-glycosides, synthesis of spiro-lactones their uses in the synthesis bioactive natural products pyrenolide analogues.

- **Ring-Contraction *vs* Ring-Expansion Reactions of Spiro-Cyclopropanecarboxylated Sugars**

In this research work mainly describes the electrophilic ring-opening of spiro-cyclopropanecarboxylated sugars followed by reaction with 1,8- diazabicyclo[5.4.0]undec-7-enethat revealed an interesting ring-contraction and ring-expansion reactions depending on the substrate and the kind of hydroxyl protective group present adjacent to the spirocentre. A stereoselective method for accessing a new class of carbon chain extended keto-furanoses and *C*-glycosylated bicyclic compounds is reported.

Spiro-cyclopropanecarboxylated sugar derivatives were prepared by cyclopropanation of various sugar derived protected *exo*-glycals with methyl diazoacetate (MDA) and catalytic amount of $Rh_2(OAc)_4$ in moderate yields and with good diastereoselectivity. *N*-Iodosuccinimide (NIS) mediated ring-opening of these spiro-cyclopropanecarboxylated sugar **1** (TBS group adjacent to the spirocenter) in dioxane/water provided the α,β-unsaturated ester **2** in excellent yield. Reaction of **2** with 1,8- diazabicyclo[5.4.0]undec-7-ene in CH_2Cl_2, at 0 ^oC gave the ring contracted product **3** in good yield as a single diastereomer. This methodology was successfully applied to various sugar derived (pyranose or furanose) spiro-cyclopropanecarboxylates to provide the corresponding hemiacetals in moderate to good yield.

In addition to the ring contraction reaction, ringexpansion reaction was also developed using fused bicyclic spiro-cyclopropanecarboxylated sugar derivatives. In this protocol electrophilic ring opening of the spiro-cyclopropane carboxylate **4** with *N*-iodosuccinimide dioxane/water provided the ring opened α,β-unsaturated ester **5** which upon exposing to 1,8-diazabicyclo[5.4.0]undec-7-ene providing the ring-expanded bicyclic-pyrano[3,2-*b*]pyran derivative **6** as a single diastereomer. This protocol was also successfully implemented to various fused bicyclic spiro-cyclopropanecarboxylated sugar derivatives to synthesize the corresponding bicyclic compounds.

Organic Letters **2013**, *15*, 4474-4477.

- **Stereoselective synthesis of 1,6-dioxaspirolactones from spiro-cyclopropanecarboxylated sugars: Total synthesis of dihydro-pyrenolide D**

Here we described the synthesis of a thermodynamically driven stereoselective synthesis of 1,6-dioxaspiro[4.n]decan-2-one systems (n = 4, 5) from spiro-cyclopropanecarboxylated sugar derivatives. The reaction involves a one-pot cyclopropane ring opening followed by cyclization to form -spiroketal -lactone moiety. The generality and the stereoselectivity of the reaction are examined by synthesizing a series of spirocyclic systems.

The above strategy was applied to various pyranose and furanose derived spiro-cyclopropanecarboxylated sugars to give the corresponding spiro-lactones in good yield.

Further the methodology was extended to the synthesis of dihydropyrenolide D and epi-dihydropyrenolide D from xylose derived fused bicyclic spiro-cyclopropanecarboxylate.

*RSC adv.***2015**, *5*, 8142–8145.

- **Synthesis of β-*C*-Glyco Amino-acids from spiro-cyclopropanecarboxylated sugars**

The electrophilic ring-opening of donor-acceptor spiro-cyclopropanecarboxylated sugar **12** was shown to provide an easy access to the stereoselective synthesis of β-*C*-glycosyl D- and L-alanine derivative **14** via the formation of α-iodo ester **13**. The reaction is highly stereoselective providing the β-*C*-glycoside. A possible mechanism is proposed for the ring-opening reaction based on the obtained crystal structure of one of the spiro-cyclic sugar moiety. This novel method was further extended to the synthesis of various β-*C*-glycosyl D- and L-alanine derivatives

Israel Journal of chemistry **2015**, *56*, 558-565.

Research Summary of Post-doctoral work

- **2-Deoxyglycosyl 3-benzoylpropionates as novel donors for the direct and stereo-selective synthesis of 2-deoxyglycosides**

Lewis acid mediated stereo-selective synthesis of 2-deoxy *O*-glycosides has been demonstrated using 2-deoxyglycosyl-3-benzoyl propionates as novel glycosyl donors. These newly developed donors are easily synthesized from simple glycals, stable at room temperature and react with ease to provide products with high stereo selectivity. These donors can be successfully utilized with all types of acceptors (primary, secondary and tertiary alcohols) for the synthesis of 2-deoxy glycosides. Interestingly these newly developed glycosyl donors are also efficient for the synthesis of trisaccharide. For that we commence reaction with 2-deoxy galactosyl 3-benzoylpropionate **15** treated with methyl 2,3,4-tri-*O*-benzyl-α-D-glucopyranoside **16** in presence of scandium (III) triflate ($Sc(OTf)_3$) at room temperature (1h) afforded 2-deoxy α-glycoside **17** as the exclusive product in 75% yield. This newly developed methodology was successfully utilized in the preparation of trisaccharide.

Org. Biomol. Chem. **2018**, *16*, 2248-2257.