

September 11, 2010

To

Dr. B. Krishnamurthy
Controller of Examinations i/c
Thiruvalluvar University
Fort Campus, Vellore-632004

Ref.: TVU/COE/PhD/No. 2455 dated 22-03-2010

Dear Dr. Krishnamurthy:

Thank you for your invitation to be a member of the Board of Examiners to Adjudicate the Doctoral thesis submitted by Mr. Mohamed Imran PK. After careful review of the thesis, I am submitting my expert comments on the Doctoral thesis along with this letter.

I congratulate both the Doctoral student and the Guide Dr. Subramani for their excellent contribution to the Science. Again, I am honored to serve as a Board of examiners and thank you for the opportunity.

Thank you

Yours truly,



Barur R. Rajeshkumar, PhD 9-11-10.

Senior Research Scientist
S3-734 Department of Surgery
University of Massachusetts Medical School
55 Lake Avenue North, Worcester, MA 01655
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CC: Dr. K. Subramani



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THIRUVALLUVAR UNIVERSITY
FORT CAMPUS, VELLORE - 632 004

PROFORMA FOR ADJUDICATION OF THE Ph.D. THESIS

1. Name of the Candidate : **Mr. Mohamed Imran PK**
2. Title of the thesis :
"CHEMICAL REACTIVITYSTRUCTURE-PROPERTY EVALUATION OF SMALL MOLECULES"
3. Discipline and subject : **Chemistry**
4. Name and address of the Examiner : **Dr. Barur R. Rajeshkumar, PhD**
Senior Research Scientist
S3-734 Department of Surgery
University of Massachusetts Medical School
55 Lake Avenue North, Worcester, MA 01655 Phone: 508 856 6225
5. Recommendations of the Examiner: (Please strike out whichever are not applicable)

☒ a) Thesis is highly commended, the public Viva-Voce be conducted and Degree may be awarded.

(OR)

b) Thesis is commended, the public Viva-Voce be conducted and Degree may be awarded.

(OR)

c) Thesis is commended and Degree may be awarded subject to the condition that the candidate furnishing satisfactory clarification to my queries during the public Viva-Voce examination.

(OR)

d) Thesis is commended and Degree may be awarded subject to the condition that the corrections/modifications, suggested by me are to be carried out in the thesis and duly certified by the Supervisor - Convener before the public Viva-Voce examination.

(OR)


e) Thesis is not commended and the Degree may not be awarded and the candidate may be asked to revise and resubmit the thesis.

(OR)

f) Thesis may be rejected outright and the Degree not be awarded.

Note : Please enclose your detailed report on the thesis. Also enclose list of questions, if any to be asked at the public Viva-Voce examination.

6. Any other remarks: Thesis Comments attached


(Signature of Examiner) 9-11-10.

with designation.

Address: Dr. Barur R. Rajeshkumar, PhD

Place : Worcester, MA, USA

Date : September 11, 2010

The thesis "*Chemical Reactivity Descriptors from Theoretical Methods for Structure Property Evaluation of Some Small Molecules*", by Mr. Mohamed Imran P K, has come out as an excellent work relating to the present scenario of Molecular Modelling and Drug Discovery. Introductory section is relevant to the idea of molecular descriptor and reactivity. The molecules chosen for study are in tune with the present demand for a better drug or pharmacophore. Though majority of the molecules are virtual, an excellent argument has been made in the light of the available theories for their preparation and subsequent analysis *in vitro* and *in vivo*. While the first part of the molecules under study constitute unusual amino acids (Ornithine) having some common substituent's on them. The second part of the study is an evaluation of an anti-cancer drug (thiotepa) from a very basic skeleton of the molecule *sans* hetero atoms. Atom substituents have been made gradually and their influence on molecular property and activity has been done both at the DFT and *ab-initio* methods. Molecular Mechanics and Semi Empirical methods have been initially used. The docking part of the work is an appropriate additional work in the thesis to support the argument in favour of the molecular properties established. This has paved the way for studies called 'scaffolding' works on chemically and biologically important molecules.

In the third part of the work Quantitative Structure Activity Relationship has been carried out with prepared molecules. The number of compounds would have been more to add to the credibility of the model generated. Nevertheless, the tested molecules and the experimental part suffice the scope of work of this thesis. The thesis is, therefore, **HIGHLY COMMENDED**. I congratulate both the wish both the Doctoral Student Mr. Mohamed Imran P K And his research guide Dr. Subramani Kulla Gounder for their excellent contribution to the scientific society and wish them all best.


9-11-10.

A few specific comments may, however, be directed at the candidate during viva interface.

Specific Comments:

1. Excellent work to prove the predictions in Chapter 1. But a technical question: Why was the water molecules removed from the Ornithine Decarboxylase (ODC, P-90)?
2. The crystal structure of CYP2B6 was obtained after homology modelling. In P-138, Rule of Five is mentioned and only four rules are given. Is the candidate aware of this?
3. In Chapter 8, an excellent quantitative work with syn and anti isomers of a heterocyclic compound was carried out by the candidate. How were the isomers established? There is mention about no evidence of intra molecular hydrogen bonding with regions of opposite MESP in the molecule. This aspect is very significant given the fact that most of the drugs bind with H-bond and other non-covalent forces.



A handwritten signature in blue ink, followed by the date '9-11-10'.