

## Preface

First of all, I would like to thank all participants who contribute their paper in the 16<sup>th</sup> International Conference on Quality in Research (QIR), held in Padang, West Sumatra, Indonesia on 22 – 24 July 2019. The Conference objective was to open a worldwide discussion on the current role of technology in the academic and scientific areas where all scientist meet together to share their knowledge and research expertise, to discuss in the area of materials and the development of materials technology, as well as creating a prospective collaboration and networking on various areas of materials science and technology. We hope this conference was a kick-off for the strengthened action and partnerships on creating a platform for us; national and international thinkers, academics, government officials presented and discussed the pivotal role of engineers in innovative products which will reduce environmental impacts applications in sustainable planning, manufacturing, and many more to grow and ensure the rising prosperity of our society going into the future.

The 16<sup>th</sup> QIR 2019 is the continuation of the successful biannual series conference and we are pleased to bring the selected collection paper in the area of Engineering Materials and related topics to be published in Materials Science Forum Journal. All of the contributing papers in this edition have been peer reviewed by expert referees in the field of engineering materials in order to meet the scientific standard. The papers in this journal most come from Symposium on Metallurgy and Materials, and some papers come from Symposium on Advances in Mechanical Engineering, Symposium on Chemical and Process Engineering, Symposium on Infrastructure and Transport, and Symposium on Biomedical Engineering.

We do realize that the success of the 16<sup>th</sup> QIR 2019 and publication of this book are derived from the very hard work of authors, reviewers and editors; therefore, we would like to thank all people who involved in this publication. Especially to the members of the Organizing Committee, our International Advisory Board and distinguished Reviewers for all of their support and advice. Your presence and contribution to the 16<sup>th</sup> QIR 2019, would be highly appreciated to the success of this event. We also owe our success to the full support of the Rectors of Universitas Indonesia and last but not least, a special thanks to our co-hosts, the Dean of the Faculty of Engineering. The University of Andalas, Padang for all of their immense supports in making this conference a success.

Allow me to wish all of you a meaningful and rewarding conference. We wish you a pleasant and memorable stay in Padang. Thank you, and we hope to see you again in the next QIR meeting.

Organizing Committee  
International Symposium on Metallurgy and Materials Engineering  
The 16<sup>th</sup> International Conference on Quality in Research (QIR)