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Preface

From June third to sixth of 2013, a conference in honor of Michael Mackey's 70th birthday was organized at the University of Lyon in France. About 60 participants coming from 18 countries attended this event. The audience was a mix of on the one hand, colleagues and former students, who had crossed Michael's path at least once in their life, and on the other hand of senior and junior researchers working in Michael's research field.

The spirit of the conference was to give the opportunity to everyone to meet, talk and exchange fruitful ideas on different topics such as stochastic equations, neurosciences, gene regulation, cell cycle, physics, oscillatory dynamics and mathematical biology in general. Junior researchers were able to present their work to senior researchers and then extend and strengthen the tremendously rich research network built by Michael throughout decades.

Michael Mackey, one of the world-leading experts in mathematical biology, was worth a conference to celebrate his 70th birthday. His contribution to the science community in general, and mathematical biology more particularly is amazing. His work has inspired a great quantity of researchers. He was also the mentor of a large quantity of students who kept great memories working with him, under his fatherhood eye. These students are now researchers who carry on the same spirit and form the next generations for future fascinating discoveries.

Michael is a man of passion, sympathy, great care, enthusiasm and strong friendship and one could feel it in the conference mood: every participant seemed to be thrilled to get together for this short time, like a family meeting, an enchanted break during this week of Spring 2013.

Michael C. Mackey was also a guest editor in chief for the MMNP journal in 2010 for the issue dedicated to Mathematics and Neurosciences (vol. 5, issue 2, 2010), also a great issue with great contributors.

We hope that the reader will find a great pleasure reading the contributions of senior and junior researchers for this issue where topics are as diverse as:

- hematopoiesis and blood diseases [1], [4], [7],
- fluid-structure interaction model of the cell membrane deformation [2],
- respiratory control and the onset of periodic breathing [3],
- simulating stochasticities in chemical reactions with deterministic delay differential equations [5],
- age structure and delay equations applied to predator-prey models [6],
- multiscale models in neuroscience [8]
- diffusion and deterministic systems [9].

We finally wish that the MMNP journal spirit keeps the same energy, passion and enthusiasm in sharing knowledge about mathematics applied to biology, physiology and medicine in the same way as professor Michael C. Mackey did during his great career that we hope will last for few more decades.

On behalf of the editorial board,

Laurent Pujo-Menjouet

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During the first week of June, 2013, a rather extraordinary (for me) event took place in Lyon at the University Claude Bernard Lyon 1. It was a celebration of my 70th birthday, and the impeccable organization was spearheaded by my former student and postdoctoral fellow, Dr. Laurent Pujo-Menjouet. Many of my former (and current) students and collaborators were present as well as a number of other interested individuals, and it was a wonderful week for me. We (all 60 people registered from 18 different countries) were treated to 41 talks over a four day period and the span of the science presented and the questions being asked made it one of the most stimulating meetings I have had the pleasure of attending for many years. In addition to the diversity of the science presented, there was ample opportunity for much informal discussion during the course of each day. The opportunity of seeing so many colleagues collected together in one place was most heartwarming, as was the chance to get to know many new people.

As a reader of this volume you will be able to gain some impression of the diversity of the scientific presentations from the papers presented here, ranging from questions involving control of respiration through the nature of solution behaviour in differential delay equations to very practical applied problems concerned with cellular replication and maturation. I hope you find them as interesting to read as I did while listening to them.

Michael C. Mackey

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