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Jeffrey A. Stuart · Ellen L. Robb

Bioactive Polyphenols from Wine Grapes

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Preface

As biomedical researchers working and living in Niagara, Canada's preeminent wine region (apologies to the Okanagan Valley, Prince Edward County, and the Annapolis Valley), we have often been struck by how divergently researchers working in different fields approach the biology of grapevine polyphenols. Plant physiologists focus their efforts on methods for isolating and quantifying these molecules. Plant molecular biologists attempt to map the synthetic pathways responsible for the production of grapevine polyphenols, and transgenically augment their production, sometimes in other plant species, to assist in their further development into pharmaceuticals. Grape growers are interested in all of these activities, as they may lead to new markets and commercial applications for these molecules that are often found in abundance in some of the "waste" by-products of their annual harvest. Animal physiologists have revealed an increasing number of intriguing effects that might be harnessed to improve human health. Cell biologists have focused their attention on identifying specific molecular mechanisms that underlie the effects observed by their colleagues. At times, we have felt that researchers in these seemingly disparate fields may be tracking a parallel course, and that a convergence of these diverse perspectives would be advantageous to both the interpretation of experimental results and the process of experimental design. For these reasons, a more comprehensive overview seems certain to improve our understanding of these molecules, how they work, and how they might be fruitfully used by us. These thoughts were our motivation in undertaking this project.

Our goal here is to bring together the results of research in these various fields into a single resource to facilitate a more comprehensive understanding of the biological activities of the grapevine phytoalexins. We have focused on resveratrol and its derivatives since these have attracted by far the most attention amongst researchers for their ability to positively modulate human physiology. However, we hope that this resource will aid researchers in recognizing the many molecules beyond resveratrol with the potential to be studied and perhaps developed into nutraceuticals. To this end we feel that the book comes at an important moment in the field, as resveratrol derivatives, such as pterostilbene, piceid, and viniferins, seem to be on the cusp of attracting the kind of attention hitherto reserved for resveratrol itself.

Indeed, we hope that this book will serve as a catalyst for more research on the biological activities of these structurally related molecules in mammals, particularly humans, since in many instances they are both more abundant than resveratrol in grapevine tissues, are less rapidly degraded and excreted *in vivo*, and appear capable of eliciting very similar biological activities in mammalian cells and tissues. We hope that readers will find this book to be of use in their own research and development endeavors. Cheers.

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