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**Toward Understanding the Intelligent Properties of Biological Macromolecules---Implications for Their Design into Biosensors**

Kenneth A. Marx

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  - Components of Biosensors
  - Biological Elements
  - Immobilization Methods
  - Signal Transduction Mechanisms and Biosensor Output
  - Intelligent Properties of Biological Macromolecules and Systems

**Creating Biosensors That Detect Small and Large Molecules Using Different Signal Transduction Mechanisms**

- Optical-Based Biosensors
- Chromophore-Containing Proteins in Biosensor Applications
  - The Phycobiliproteins
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**Amarjeet S. Bassi**

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**Shin-ichiro Suye**

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- Won-Yong Lee

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Bacteriorhodopsin: From Biophotonic Material to Chemical Sensor

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Wei Wei Wang
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Amarjeet S. Bassi

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Ebtisam S. Wilkins
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Publisher Summary 1
A smart biosensor, as Knopf (mechanical and materials engineering, U. of Ontario, Canada) and Bassi (chemical and biochemical engineering, U. of Ontario) define it, is "a compact analytical device that combines a biological, or biologically derived, sensing element with an electrical, optical, or chemical transducer." Stressing that it is the synergistic functional integration of component parts that makes a biosensor "smart," they present 23 chapters that together provide a multidisciplinary perspective on the field. Opening chapters discuss the intelligent properties of biological macromolecules, optical methods of single molecule detection, nanoscale optical biosensors and biochips for cellular diagnostics, conducting polymer nanowire-based biomolecular field-effect transistor, machine learning and smart biosensor functions, and neuronal network biosensors. Seven chapters then address issues of material design and selection, followed by a section on bioelectronics. The volume concludes with six chapters on applications in detection and monitoring, including optical biosensors in foodborne pathogen detection, multiarray biosensors for toxicity monitoring and bacterial pathogens, approaches to allergy detection using aptasensors, biosensors for virus detection, and detection of influenza. Annotation ©2007 Book News, Inc., Portland, OR (booknews.com)