

## About the Cover



To celebrate and preserve the achievements of our distinguished awardees, this inaugural award issue brings together the contributions of the 2024 Lifetime Achievement and SPP/JPP Young Investigator Award recipients, recognized by the Society of Porphyrins and Phthalocyanines. The winners will give their award lectures at the thirteenth International Conference on Porphyrins and Phthalocyanines (ICPP-13). Heartfelt congratulations to all honorees.

Top row: Benoît H. Lessard, Roberto Paolesse, Ann M. English, Merrill A. Biel  
Bottom row: Ryan G. Hadt, Hiroshi Imahori, Martin Stillman

Please note that Martin Stillman's contribution will be featured in a future issue.

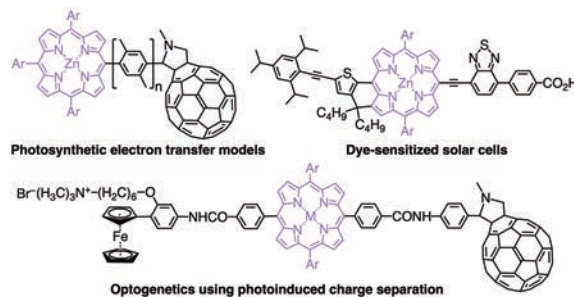
## Reviews

### pp. 319–337

#### Porphyrins as key components for photoinduced charge separation, solar cells and optogenetics

Hiroshi Imahori\* and Midori Akiyama

We show that porphyrins are very useful building blocks as an electron donor as well as an energy donor/acceptor for photosynthetic and solar cell models, dye-sensitized solar cells and bulk heterojunction solar cells, as well as optogenetics based on photoinduced charge separation.

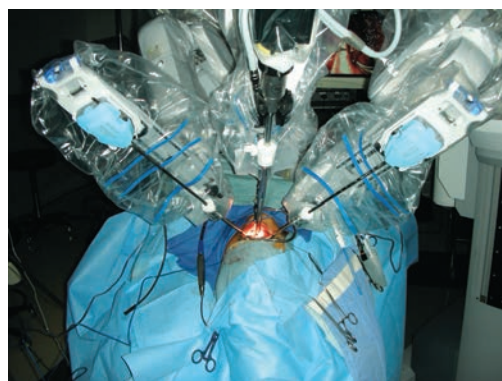


### pp. 338–348

#### Clinical photodynamic therapy: The evolution of photodynamic therapy treatment of head and neck cancer

Merrill A. Biel\*

Over the past five decades, head and neck cancer PDT has evolved as newer and more targeted photosensitizers became available for clinical use, as well as advances in laser and fiberoptic technologies allowing for the activating light to be successfully and more easily delivered deep into large invasive tumors. In addition, PDT can be accurately delivered using endoscopic, robotic, CT, ultrasound and MRI guidance, specifically targeting the tumor and reducing treatment morbidity. Significant progress has been achieved in the case of use and treatment efficacy of head and neck cancer PDT in various stages of the disease. Photo: Surgical robotic PDT light delivery to a supraglottic and tongue base tumor.



Articles

pp. 349–357

**Soluble zinc phthalocyanines as chemical probes for  $\Delta$ -9-tetrahydrocannabinol in different solvents**

Laura Karlin, Halynne R. Lamontagne, Sumit Chaurasia, Michael Triglav, Cory S. Harris, Adam J. Shuhendler, Jaclyn L. Brusso\* and Benoît H. Lessard\*

Soluble zinc phthalocyanines were synthesized and their interaction with  $\Delta$ -9-tetrahydrocannabinol (THC) was studied using spectroelectrochemistry. The choice of solvent and the functional groups of the zinc phthalocyanines significantly affect the resulting interactions.

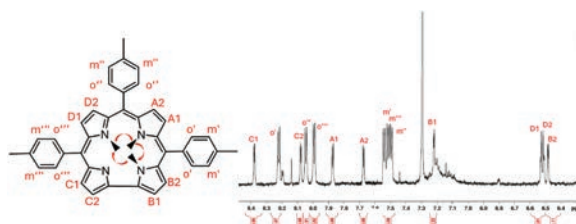


pp. 358–369

**N-Alkylcorroles**

Francesco Pizzoli, Sara Nardis, Alessia Fata, Martina Marsotto, Greta Petrella, Frank R. Fronczek, Kevin M. Smith and Roberto Paolesse\*

Functionalization of the inner core nitrogen atoms was investigated in 5,10,15-tritrylcorrole, leading to a series of *N*-alkyl substituted corroles. The preparation of *N,N,N*-trimethylcorroles is described and their structure characterized by employing different NMR techniques. This study provides insights into factors driving the substitution in triarylcorrole derivatives.

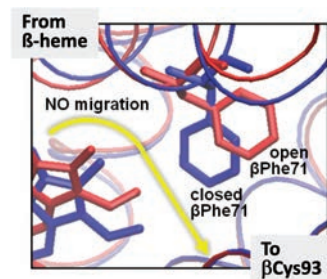


pp. 370–382

**Hemoglobin's  $\beta$ -subunit is primed to synergize oxygen delivery with nitric oxide-mediated increased blood flow**

Maria S. Shadrina, Julie Laterreur, Gilles H. Peslherbe and Ann M. English\*

Simulation and experiment reveal that NO migration in its  $\beta$ -subunit and S-nitrosation of its conserved  $\beta$ Cys93 are controlled by hemoglobin's R $\rightarrow$ T transition. Hence, hemoglobin plausibly synergizes the release of O<sub>2</sub> and nitrovasoactivity from red blood cells to meet tissue metabolic demands.



pp. 383–389

**Quantifying the effects of peripheral substituents on the spin-lattice relaxation of a vanadyl molecular quantum bit**

Stefan H. Lohaus, Nathanael P. Kazmierczak, Kaitlin M. Luedecke, Benjamin Marx, Victor N. Nemykin and Ryan G. Hadt\*

In this study, we used pulse EPR spectroscopy to compare the spin-lattice relaxation of two molecular quantum bit candidates, VOPc and VOPyzPz-DIPP. Both molecules are similar, but VOPyzPz-DIPP has bulky ligand substituents that increase the distance between the spin centers, improving its spin coherence times. However, the added substituents also affect the vibrational spectrum, adding low-energy phonon modes and breaking molecular symmetries. This causes a drastic change in the spin-lattice relaxation behavior (both as a function of temperature and field), implying different relaxation pathways.

