New potent sensitizers for photodynamic therapy: 21-oxaporphyrin, 21-thiaporphyrin and 21,23-dithiaporphyrin induce extensive tumor necrosis.

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Streszczenie

New sensitizers for photodynamic therapy (PDT) are reported. These compounds, namely 21-thiaporphyrin, 21,23-dithiaporphyrin and 21-oxaporphyrin, reveal some of the properties required for such therapy. Their physicochemical, chemical and pharmacological features meant that we could use them in the treatment of transplantable BFS1 fibrosarcoma in Balb/c mice. New sensitizers and the well-known chlorin e6 (Ce6) were used in doses of 2.5, 5.0, 7.5 and 10.0 mg/kg body weight, given intraperitoneally and followed by light irradiation, the total light doses being 50, 100 and 150 J/cm(2) within 24 h after injection. The effectiveness of new sensitizers in PDT was evaluated with in terms of tumor necrosis intensity, the survival time of treated animals, the rate of tumor response (complete/partial/no response), and skin photosensitivity. These results were compared to results obtained in analogous conditions after Ce6-PDT. Distribution studies revealed that the highest concentration of new compounds occurred within 24 h after injection. The results of these experiments confirmed that 21-thiaporphyrin, 21,23-dithiaporphyrin and 21-oxaporphyrin can be considered as potent tumor photosensitizers that do not exert any unwanted effects, primarily skin photosensitization. We suggest that these porphyrins are possible sensitizers to be applied in clinical PDT.