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with simultaneous PDT and PTT combination. ICG-ALA exhibited excellent biocompatibility and when treatment coupled with 640/808 nm 5 min co-irradiation caused significantly stronger phototoxicity at very low concentrations. ICG-ALA demonstrates visualization of cancer cells in both NIR (ICG) and visible (PpIX) regions allowing imaging-guided phototherapy.

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520 oral

Synergistic response of PEG coated manganese dioxide nanoparticles conjugated with doxorubicin for breast cancer treatment and MRI application

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Significance: In this research work, we designed a smart biodegradable PEG-coated MnO2 nanoparticles conjugated with doxorubicin (PMnO2-Dox NPs) for dual chemo-photodynamic therapy and magnetic resonance imaging (MRI) application.
Approach: PEG-coated MnO2 nanoparticles were synthesized by applying CVD apraoch.
Results: Surface morphology was confirmed via SEM analysis, results indicated the spherical and asymmetric agglomerated nanocluster of PMnO2-Dox NPs. In in vitro bioassay, the anticancer activity of PMnO2-Dox NPs were tested against breast cancer (MCF-7) cell line.
Results suggested that PMnO2-Dox NPs not only convenient for cancer treatment via combined chemo-photodynamic therapy but also address the way towards a comprehensive strategy for MRI application.
Conclusion: Current experimental strategy is very effective and comprehensive and cost effective.

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522 oral

Exploration of Treatment Parameters and Theoretical Basis of Hematoporphyrin-Based Photodynamic Therapy in Cholangiocarcinoma

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Objective: This study investigates the hemoporphyrin-based PDT for human cholangiocarcinoma cell lines RBE and HuccT1.
Methods: The treatment effect and treatment parameters were evaluated from both cell and xenograft mouse models.
Results: The optimal therapeutic dose and photosensitizer concentration for hemoporphyrin-based PDT cholangiocarcinoma cells were 2 J/cm^2 and 1.5 μg/mL, respectively. In the xenograft mouse model, there was a significant difference in tumor volume between the experimental and control groups on days 7, and 14 post-treatment ($p < 0.05$). On day 15, the tumor volumes of 0.54 ± 0.07 cm^2 and 1.35 ± 0.21 cm^2 in the experimental and control groups were statistically significant. The expression levels of CD31, VEGF-A, MMP2, MMP9 and Ki-67 in the experimental group were significantly reduced, while the Caspase-3 and Caspase-8 were opposite.
Conclusion: In vitro and in vivo results showed that hemoporphyrin-based PDT significantly inhibited the growth of cholangiocarcinoma cells.

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523 Poster

Laser gingivectomy - A case analysis of gingival hyperplasia after 7 years of full-mouth implant surgery

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One patient developed symptoms of gingival hyperplasia after 7 years of full-mouth implant surgery. Gingival hyperplasia refers to the abnormal growth of gingival tissue, which may cover part or all of the implants. It not only affects the appearance, but also may pose a threat to oral health. In response to this situation, the patient underwent laser gingivectomy. The operation uses laser technology to accurately remove the hyperplastic gingival tissue, which has the advantages of less bleeding, faster recovery and less pain. After treatment, the patient 's gingival condition was significantly improved, and the stability and aesthetics of the implant were also improved. This treatment experience shows that laser gingivectomy is an effective method for the treatment of gingival hyperplasia.

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526 oral

Photodynamic therapy combined with radiotherapy combination in murine melanoma treatment

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Melanoma is the type of skin cancer with the highest mortality rate and presents resistance mechanisms to several treatment techniques. Radiotherapy (RT) generates free radicals that react with cellular macromolecules such as DNA, RNA, proteins and membranes, causing dysfunction and cell death. This damage can favor the result of a consecutive application of photodynamic therapy (PDT), either by allowing greater penetration of the photosensitizer into the cells or by weakening the defense mechanisms. On the other hand, PDT promotes direct damage to the cell that can activate an immune response against tumor cells, which can optimize the effect of another technique applied in sequence, such as RT. This study compares different combinations of RT and PDT in the treatment of melanoma using balb/c nude mice and B16F10 cell line.

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527 Poster

pH-Responsive Polyzwitterion Modified Photosensitizer for Precision Photodynamic Therapy

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Insufficient tumor accumulation and poor selectivity of photosensitizers remain major obstacles to the efficacy of photodynamic therapy (PDT) in cancer treatment. To address these limitations, we developed a tumor targeting photosensitizer-polymer conjugate by conjugating pyropheophorbide-a (Ppa) with a pH-responsive polyzwitterion,

PGlu(DET-Car). This conjugate transitions from a negative charge at physiological pH, preventing interactions with normal cells, to a positive charge in acidic tumor microenvironments, enabling pH-dependent cellular uptake and selective tumor accumulation. Compared to PEG-modified Ppa and free photosensitizers, PGlu(DET-Car)-modified Ppa showed significantly enhanced cellular uptake and phototoxicity under acidic conditions in vitro. In vivo studies demonstrated its prolonged blood circulation, superior tumor accumulation, and effective PDT performance, with minimal off-target effects on normal tissues. These results highlight the potential of pH-responsive polyzwitterion-based systems as a promising platform for tumor-targeted therapies, addressing critical limitations of conventional PDT approaches and providing new strategy for precision cancer treatment.

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529 Poster

Ultrasonic Scalpel Surgery combined with Photodynamic Therapy Versus Trichloroacetic Acid Application in Treating HPV-Related Condyloma Acuminata

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Genital infection with Human Papillomavirus (HPV) is a disease that affects a large fraction of the world's population. Condylomata acuminata or anogenital warts are benign lesions that are part of the clinical infection caused by low-risk HPVs, such as HPV6 or HPV11. This randomized clinical study, aimed to evaluate the efficacy of two different therapeutic approaches in treating genital lesions induced by HPV. Group 1, with 18 patients, received an innovative treatment combining lesion excision with an ultrasonic scalpel followed by photodynamic therapy (US+PDT). Group 2, with 18 patients, underwent standard treatment with 80% trichloroacetic acid (TCA). The US+PDT group required fewer treatment sessions, exhibited superior cosmetic outcomes, and reported zero lesion recurrence during an 18-month follow-up, in contrast to the TCA group's recurrence rate of 33.3%.

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531 oral

Study of the efficacy and safety of photodynamic therapy for pigmented nevus using various photosensitizers under the control of fluorescence diagnostics and assessment of tissue hemoglobin oxygenation

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Significance: Photodynamic therapy in combination with various photosensitizers offers a potential alternative to surgical resection of pigmented nevus, with the advantage of preserving healthy surrounding tissue and preventing keloid scar formation.
Approach: Photodynamic therapy of pigmented nevus was applied under the control of video and spectral fluorescence diagnostics and spectroscopic evaluation of hemoglobin oxygenation in tissues.
Results: The treatment of pigmented nevus resulted in the regression of the skin lesion area, without the formation of keloid scar tissue.
Conclusions: Photodynamic therapy has been demonstrated to be a safe and effective treatment for pigmented nevus, ensuring precise exposure to the pathologic tissue without damaging the healthy tissue.

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532 Poster

PpIX production analysis from ALA solutions application for the treatment of recurrent respiratory papillomatosis

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Recurrent respiratory papillomatosis (RRP) of the larynx is caused by human papillomavirus (HPV), resulting in symptoms such as hoarseness and respiratory difficulties. Surgical removal of the lesions is the standard treatment, but there is a high recurrence rate. Photodynamic therapy (PDT) may be a promising treatment due to its selectivity. Keratinized lesions were chemically induced in the tongues of rats to simulate histological changes of these lesions. Different formulations and application methods of the prodrug aminolevulinic acid (ALA) were tested: ALA with xanthan gum in gel form, ALA in saline solution, and ALA with DMSO in liquid form, with two application methods, directly on the lesion or in the throat, simulating systemic application and monitored for a period of 7 hours for the protoporphyrin IX production. These studies provide knowledge for the development of clinical protocols for the treatment of RRP.

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533 Poster

Combination of photodynamic and sonodynamic therapy combating massive melanoma in pigs

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Photodynamic (PDT), sonodynamic (SDT) and sonophotodynamic (SPDT) therapy are alternatives for conventional treatments against cancer. They are Reactive Oxygen Species (ROS) based treatments which the reactive species are able to induce to kill cells and tumor necrosis. Singlet pigs with massive skin melanoma were used. Photogem (2 mg/kg) intravenous was injected 6 hours before treatment. For the treatment, Sonidel SP300 with an effective radiation area (ERA) of 5.0 cm^2 was coupled to the surface of the tumor. A total dose of 100J/cm^2 was delivered by LED (630 nm). Treatments were conducted in two equal sections. A significant reduction of treated and non-treated tumor size was observed, while clinical signs showed increase in the health of the animal. A notable increase in weight was observed. The synergy between PDT and SDT, can be a good approach for melanoma control.

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