

# Photo Catalyst that was used to Inactivate Microcystis Aeruginosa

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## Description

A 16-year-old man presented with massive perirenal fluid and severe nephrotic syndrome. After three percutaneous drainages of fluid, renal function and hypertension improved, but perirenal fluid recurred within days. Steroid treatment was ineffective for nephrotic syndrome. Permanent fluid drainage into the peritoneal cavity was made possible by a bilateral laparoscopic fenestration of Gerota's peritoneum and fascia. A renal wedge biopsy was done in the same procedure. The tip lesion variant had advanced focal glomerular sclerosis, as revealed by histological examination. Rituximab, cyclophosphamide, and mycophenolate treatment of the glomerular disease were ineffective. However, despite the persistent nephrotic syndrome, perirenal fluid did not recur, indicating that Gerota's fascia fenestration is a successful treatment for floating kidneys in these patients. After only minor trauma, a 54-year-old man with Eisenmenger syndrome and a ventricular septum defect was admitted with right flank pain. Contrast-enhanced computed tomography imaging revealed extensive perirenal fluid (18 x 14 x 20 cm, left kidney) and a hematoma (12 x 8 x 17 cm, right kidney), both of which active with right-side were bleeding. The subcapsular fluid appeared to significantly compress the left kidney. Intraarterial angiography revealed a coil-occluded vessel and contrast extravasation from a peripheral branch of a mid-segmental artery (Supplementary Figure S2). Over the course of 48 hours, 3 liters of fluid were drained from the left perirenal space via percutaneous drainage. The serum creatinine level dropped to 1.3 mg/dl from 2.6 mg/dl. The patient passed away from cardiopulmonary failure two days later, despite improvement in renal function. This is the story of a man who was just three years old and had a neuroblastic tumor in his abdomen that floated around and wasn't attached to any organs. The case presented in this presentation was not the subject of a focused and comprehensive literature search.

## Parasitic Diseases

A 3-year-old male presented to the emergency department after three days of projectile, non-bloody and bilious vomiting following every meal. A mass was palpated in the Left Lower Quadrant (LLQ), which was consistent with ultrasound findings that revealed a 7 cm discrete mass medial to the spleen and superior to the left kidney. The patient complained of

generalized abdominal pain that goes away after vomiting. Ganglioneuroblastoma surgical resection is typically curative and has a low complication rate. This patient did not experience any recurrence-related symptoms during clinical follow-up. As a result, we hypothesize that the fact that his tumor was floating around could be a factor in his continued disease-free status in the future. This is the first instance of a free-floating abdominal ganglioneuroblastoma that has been documented. The presentation of symptoms and the prognosis can be affected by this unique feature, which may necessitate special surgical considerations. Using a straightforward dip-coating technique, Nano composite was loaded onto a modified polyurethane sponge to create a floating photo catalyst that was used to inactivate Microcystis aeruginosa under visible light. The morphology, structure, chemical state, and optical properties of the GBA ternary photo catalyst were meticulously characterized following its successful fabrication. Under 6 hours of visible light irradiation, the floating catalyst removed algae cells nearly 100 percent of the time and could be retrieved and used at least three times. The GBA floating catalyst demonstrated excellent photocatalytic performance for the removal of algae under a variety of conditions when the effects of various conditions on photocatalytic performance were investigated.

These conditions included algae density, loading content of nanoparticles, and concentration of natural organic matter. In addition, the metabolic activity, cell morphology, membrane permeability, Zeta potential, photosynthetic system, antioxidant system, and physiological characteristics of algae cells during the photocatalytic process were investigated. The findings confirmed that the algae cells were severely damaged during the photocatalytic inactivation, affecting their normal physiological functions and ultimately leading to their death. Last but not least, an algae cell photocatalytic inactivation mechanism was suggested. In summary, the novel photocatalytic algae removal technology's high efficiency was demonstrated by the GBA floating catalyst's ability to effectively inactivate Microcystis aeruginosa under visible light. In the meantime, the algae removal technology can be put into use in eutrophic waters thanks to the recyclable floating material. The most important fish for commercial purposes in Chiapas and elsewhere is the Nile tilapia. Taking preventative measures to lessen the number of fish killed by parasitic diseases may be made easier with a better understanding of the dynamics of parasite infection in tilapia. Different infection dynamics may be implied by different

culture systems and environments; As a result, the infection parameters (prevalence, mean abundance, and intensity) of *Oreochromis niloticus* parasites cultured in floating cages and ponds were identified and compared in this study. From the gills, skin, fins, and intestines of 310 specimens collected from floating cages and ponds, 18 different taxa of metazoan parasites were identified. In floating cages, 14 parasite species were discovered: Eight monogenean species, one nematode, one digenea, one crustacean, and three protozoa 16 parasite taxa were identified in ponds: There were 11 species of monogeneans, 4 protozoa, and 1 crustacean. Monogenean organisms like *Cichlidogyrus sclerosus*, *C. tilapiae*, and *Gyrodactylus cichlidarum* and protozoan organisms like *Trichodina compacta* dominated both systems.

## Radiopharmaceutical

Our findings suggest that tilapia culture sanitation in Chiapas must be improved through monitoring programs. To safeguard freshwater resources that are deteriorating as a result of severe industrial, mining, and agricultural activities, environmentally sustainable remediation is required. Floating wetlands could be used as a sustainable method of treating water bodies. *Phragmites australis* and *Iris pseudacorus* seedlings were grown for 50 days in artificially prepared stormwater amended with Cd, N, and P in a greenhouse. In the case of *P. australis*, the maximum plant height, root length, and total dry biomass production was increased in the medium dose (Cd<sub>2</sub>) treatment, while the Chlorophyll Index (CCI) was increased in the high dose (Cd<sub>4</sub>) treatment compared to all treatments. It is based on solidified floating organic drop microextraction (SFODME) and syringe membrane micro-solid phase extraction (SMMSPE). The

target species was successfully identified in environmental water samples and two certified reference materials using this method. The certified values and the determined values were in good agreement. Chronic Kidney Disease (CKD) has emerged as a major obstacle to clinical diagnosis and treatment in recent years.

Multiple lesions that increase mortality risk may occur in clinical patients with chronic kidney disease. Detecting uremic toxins, such as small water-soluble solutes like uric acid, urea, and creatinine and protein-bound solutes like p-cresol and indoxyl sulfate, is the most difficult aspect of CKD. For bio-detection, the Surface-Enhanced Raman Scattering (SERS) platform is a quick and sensitive nanotechnology. For the purpose of detecting biomolecules and uremic toxins, the floating-typed SERS substrate is made by embedding silver nanoparticles (AgNPs) on poly (diallyldimethyl-ammonium) chloride (PDDA) modified Graphene Oxide (GO) nanosheets. The strong "hot spots" for enhancing Raman signals are produced by modulating AgNPs' optimal interparticle distances. Transmission electron microscopy, zeta potential, FTIR, X-ray photoelectron spectroscopy, and Raman spectroscopy are used to evaluate the characteristics of AgNPs/GO-PDDA nanosheets. The parasitic infections of tilapia in ponds were significantly higher than those in floating cages (p 0.05). Two groups were revealed by the Canonical Correspondence Analysis: The first grouped the ponds based on the abundance of *C. halli*, *C. dossoui*, *Scutogyrus longicornis*, *C. sclerosus*, and *T. compacta* ectoparasites as well as high values of nitrite, nitrate, and ammonia. The cages were organized by the second group, which included *Apiosoma piscicola*, *Lernaea* sp., *Clinostomum marginatum*, and the sp. *Contracaecum* and a high level of dissolved oxygen.