Drug delivery vehicle

THE EXISTING PROBLEM OR ISSUE
Many clinical problems including cancer, biofilms on implants and arteriovenous malformations would benefit from more specific delivery of therapeutics precisely where and when they are needed.

Light triggerable drug or gene delivery vehicles releasing their cargo on-demand respond to this need, offering temporal and spatial selectivity. However, they suffer from limited penetration of UV or visible light into biological tissues. For example, in a standard photodynamic therapy (PDT) of cancer and other conditions, currently used light sources (lasers and LEDs) can not sufficiently activate photosensitizers located in deep tissues to generate the enough amount of singlet oxygen (\(1O_2\)) or other reactive oxygen species (ROS) for therapeutic effects.

OUR SOLUTION
We have developed X-ray triggered drug delivery vehicles which can release therapeutic drugs and (or) genes when exposed to X-ray radiation. X-ray radiation has the better tissue penetrating ability compared with traditional light sources. The technique was demonstrated by X-ray triggered gene silencing and doxorubicin release.

APPLICATIONS
✓ Targeted anti-cancer drug delivery
✓ Blood clotting drug delivery via AVM
✓ Targeted gene therapy opportunity

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>BENEFITS</th>
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<tbody>
<tr>
<td>Penetration</td>
<td>Treatment to deep tissue</td>
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<td>Accuracy</td>
<td>Allows drug to specifically target area of treatment</td>
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<td>Drug delivery concurrent with radiation</td>
<td>Enhanced success and/or lowering of radiation dose</td>
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<td>Localised treatment</td>
<td>Increased drug options as treatment area is controlled</td>
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INTELLECTUAL PROPERTY POSITION
Australian Patent Application:
Liposomal system for drug delivery

WOULD YOU LIKE TO KNOW MORE?
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