Assessing *In Situ* Forming Implant Formulations Using *In Vivo* Imaging

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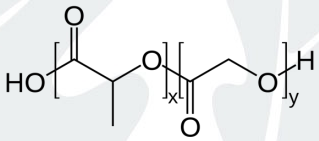
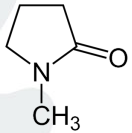


poly(lactic-co-glycolic acid)
50:50, 25.8 kDa, Acid ending

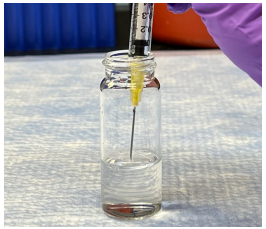


NMP

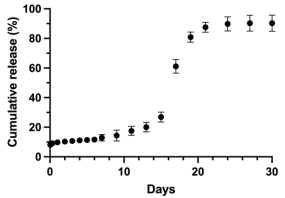
Eligard ®
Atrigel ®

Iohexol
Leuprolide acetate (LA)

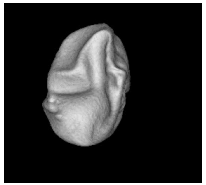
in vitro



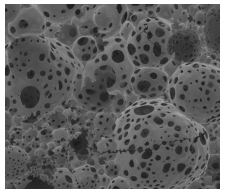
In vitro release study



CT imaging

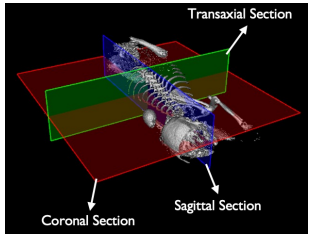


SEM



in vivo

CT imaging



Objective:

Develop a non-invasive imaging approach to obtain improved understanding of both *in vitro* and *in vivo* implant formation and evaluate the impact of drugs on the morphology of the implant.

CT: computerized tomography, NMP: N-Methyl-2-pyrrolidone, SEM: scanning electron microscope

Assessing *In Situ* Forming Implant Formulations Using *In Vivo* Imaging - CT imaging

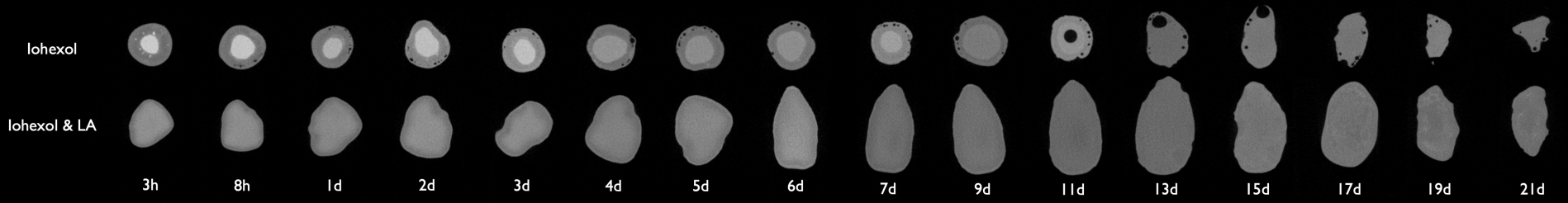


Figure 1. IVIS (*in vivo* imaging system) spectrum CT images showing the formation of *in vitro* formed implants with different drug compositions

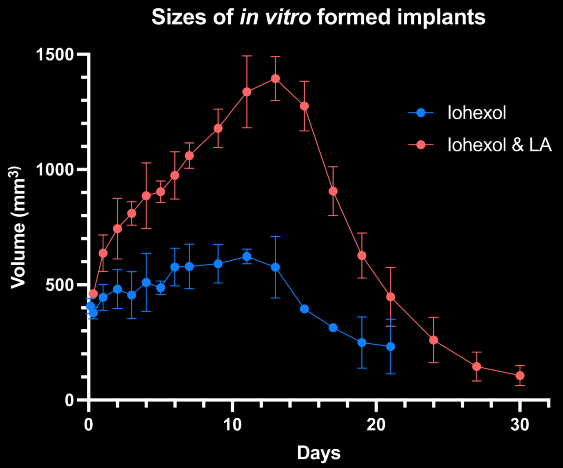


Figure 2. Mean and standard deviation of the volume of *in vitro* formed implants (n=3)

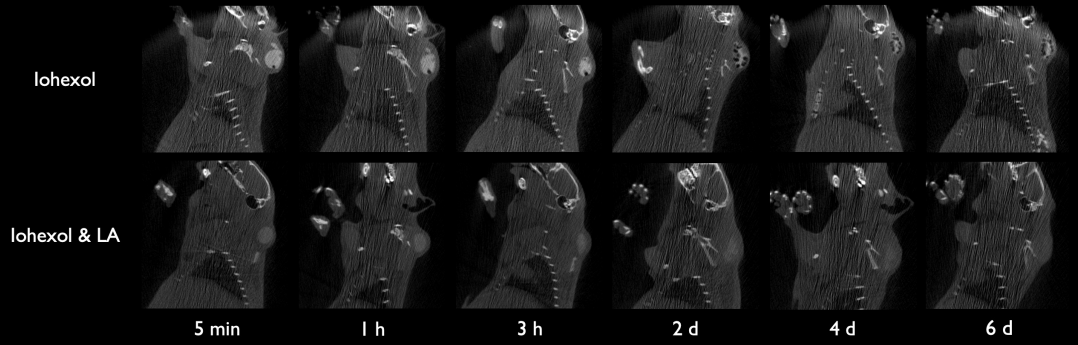


Figure 3. IVIS spectrum CT images showing the formation of *in vivo* formed implants with different drug compositions

Assessing *In Situ* Forming Implant Formulations Using *In Vivo* Imaging - SEM & *In vitro* release study

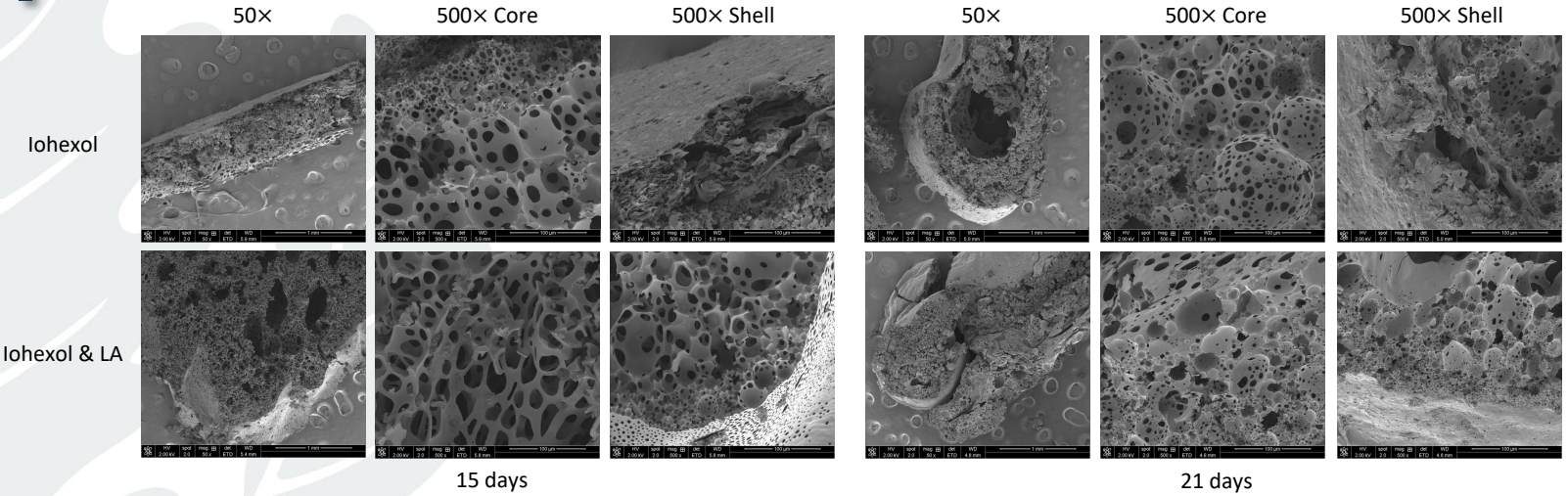


Figure 4. SEM images of *in vitro* formed implants.

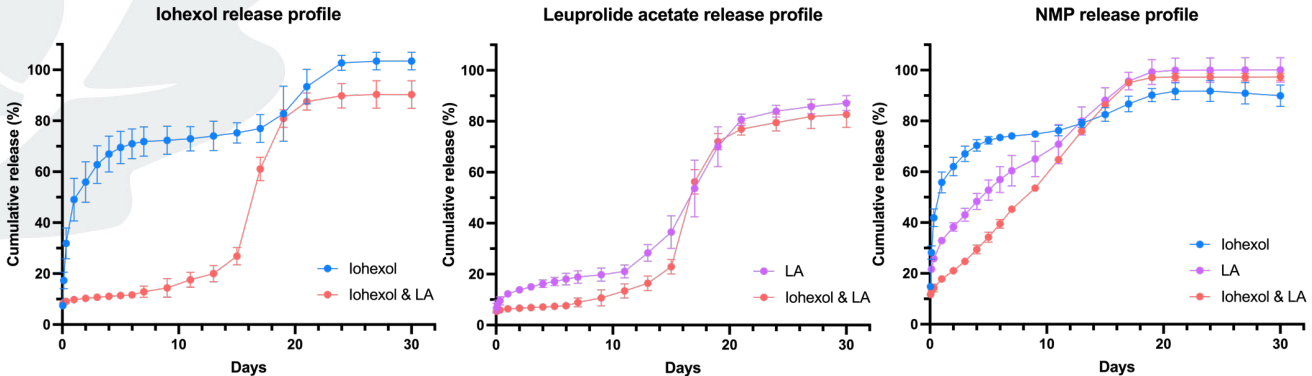


Figure 5. Mean and standard deviation of *in vitro* release profiles of *in vitro* formed implants (n=3; Iohexol: PLGA + Iohexol; LA: PLGA + LA; Iohexol & LA: PLGA + Iohexol + LA)

Assessing *In Situ* Forming Implant Formulations Using *In Vivo* Imaging - Conclusion

- Addition of leuprolide acetate changes the inner structure of both *in vitro* and *in vivo* formed implants.
- Scattering of iohexol from the core and formation of small black cavities in the shell may caused by the fast solvent exchange, which is supported by the *in vitro* release profile of NMP.
- Both iohexol and leuprolide acetate show a bi-phasic release profiles and addition of leuprolide acetate inhibits the burst release of Iohexol.
- *In vivo* imaging of implants provides a critical value for implant evaluation.

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