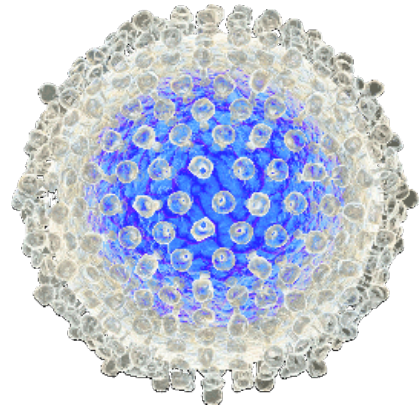
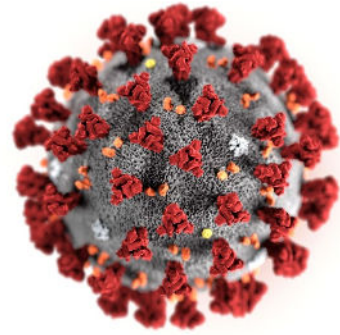


**ALIGOS**  
THERAPEUTICS



# Discovery of Liver-targeted Oral PD-L1 Small Molecule Inhibitors for the Treatment of Chronic Hepatitis B and Liver Cancers

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Tongfei Wu

On behalf of the Aligos PD-L1 Project Team

# Disclosures

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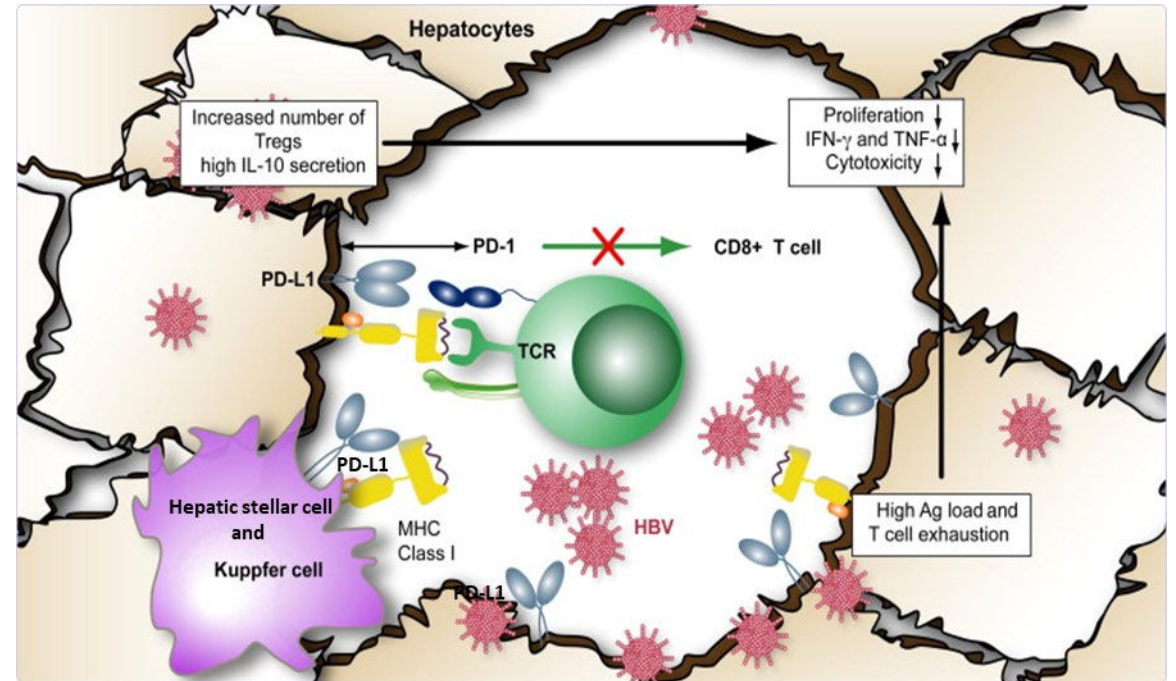
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This presentation concerns drug candidates, some of which are undergoing nonclinical studies and others of which are under clinical investigation, and all of which have not yet been approved for marketing by the U.S. Food and Drug Administration. These drug candidates are currently limited by federal law to investigational use, and no representation is made as to their safety or effectiveness for the purposes for which they are being investigated.

# PD-1/PD-L1 is a Major Pathway of Immune Tolerance to HBV

- PD-1/PD-L1 is the major co-inhibitory axis mediating T cell exhaustion in chronic hepatitis B
  - Intrahepatic HBV-specific T cells express PD-1
  - PD-L1 is present on hepatocytes and non-parenchymal cells

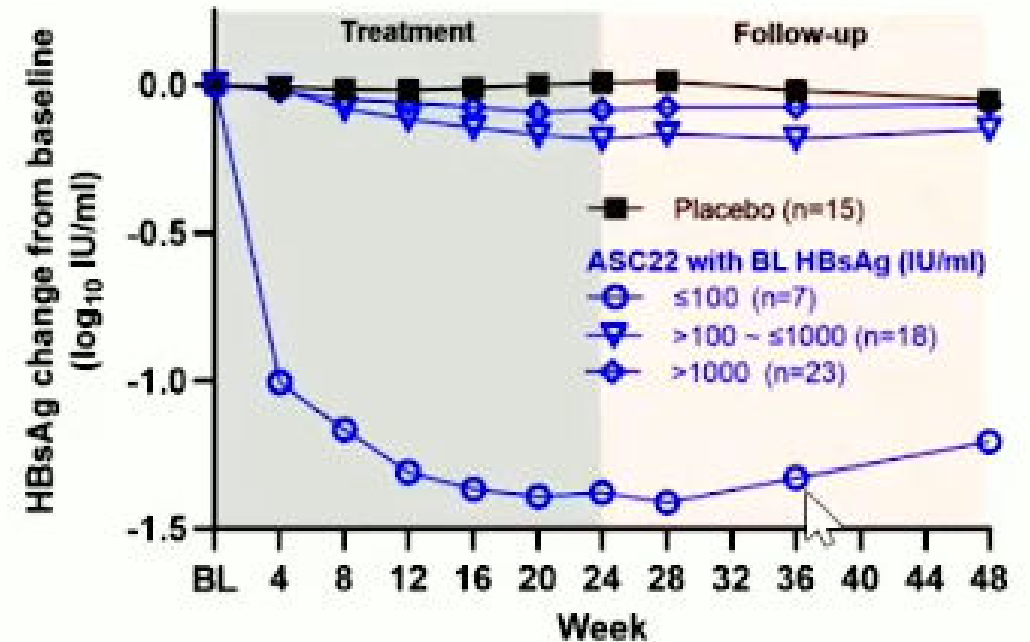


PD-L1 inhibitors can potentially reactivate exhausted HBV specific T cells

# PD-L1 is a Promising Drug Target for Treating Chronic Hepatitis B

- ASC22:
  - PD-L1 antibody, envafolelimab, in clinical trials for treatment of chronic hepatitis B (CHB)
  - Envafolelimab has been approved in China for advanced solid tumors, SC, 300 mg, Q4W
- ASC22 Phase 2b interim results for CHB :
  - 1.0 mg/kg ASC22 (PD-L1 antibody) Q2W + nucleos(t)ide analogs (NA) for 24-weeks (n=60)
  - 42.9% patients with baseline HBsAg  $\leq 100$  IU/mL (n=7) obtained sustained HBsAg loss

Phase 2b Study of ASC22 with NA (EASL, 2022)\*



Anti-PD-L1 antibody + NA treatment shows potential functional cure of chronic hepatitis B

# ALG-093702 is a Potent PD-L1 Small Molecule Inhibitor

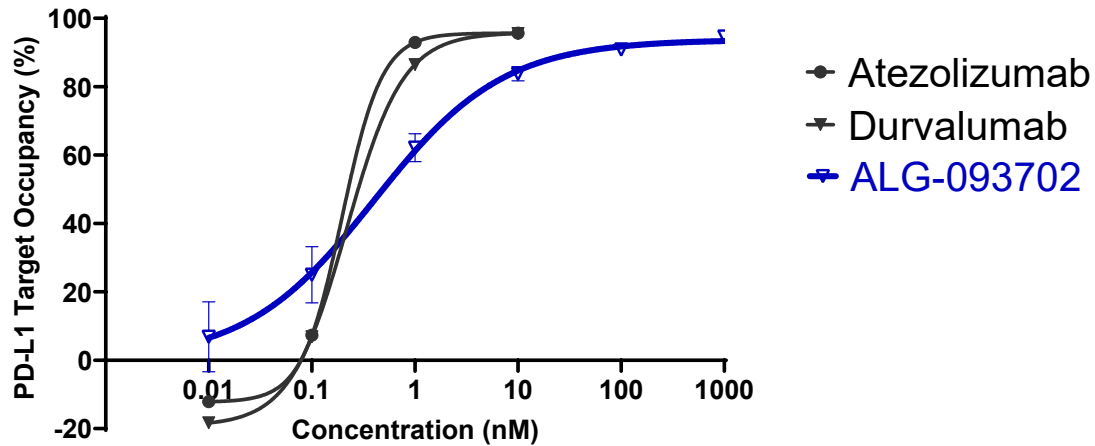
|                                 |  | Nivolumab<br>PD-1 antibody | Durvalumab<br>PD-L1 antibody | ALG-093702<br>PD-L1 SMi |
|---------------------------------|--|----------------------------|------------------------------|-------------------------|
| <b>Biochemical<br/>Activity</b> | <b>Human PD-1/PD-L1<br/>Interaction</b><br>IC <sub>50</sub> (nM) | <b>0.159</b><br>(n=2)      | <b>0.025</b><br>(n=2)        | <b>0.048</b><br>(n=2)   |
|                                 | <b>Human PD-L1 Dimerization</b><br>EC <sub>50</sub> (nM)         | <b>No dimerization</b>     | <b>No dimerization</b>       | <b>5.5</b><br>(n=2)     |
| <b>Cellular<br/>Activity</b>    | <b>Jurkat PD-1/PD-L1 Blockade</b><br>EC <sub>50</sub> (nM)       | <b>3.3</b><br>(n=2)        | <b>0.3</b><br>(n=4)          | <b>5.9</b><br>(n=8)     |

ALG-093702 but not the PD-1 or PD-L1 antibodies, induce PD-L1 dimerization  
 ALG-093702 shows similar potency to the FDA-approved PD-1 antibody nivolumab

# ALG-093702 Has a Different Mechanism of Action of PD-1/PD-L1 Blockade vs. PD-L1 Antibodies

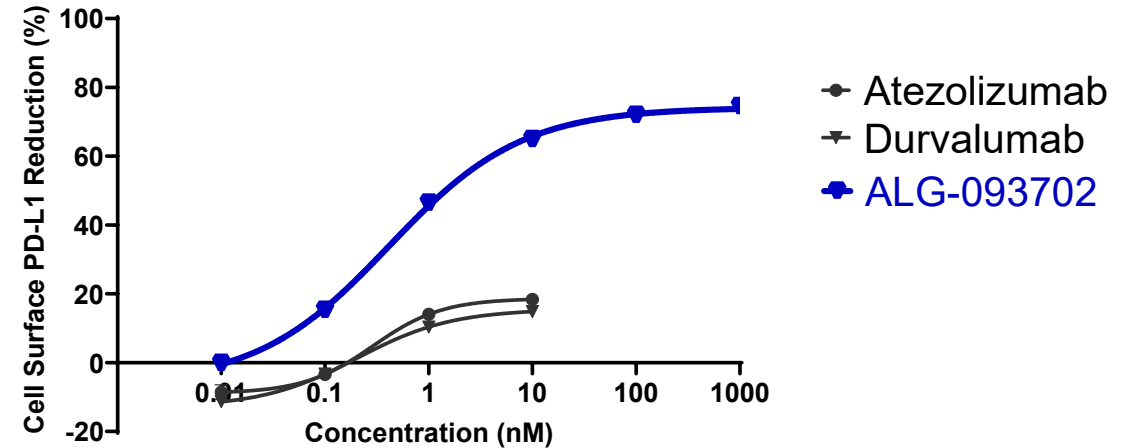
## A. Cellular PD-L1 Target Occupancy

FACS using MIHI PD-L1 antibody which competes with PD-L1 inhibitors



## B. Cellular Surface PD-L1 Reduction

FACS using Abcam 28.8 PD-L1 antibody which cannot compete with PD-L1 inhibitors



|  | Atezolizumab | Durvalumab | ALG-093702 |
|--|--------------|------------|------------|
| Target Occupancy EC <sub>50</sub> (nM) | 0.22         | 0.28       | 0.49       |

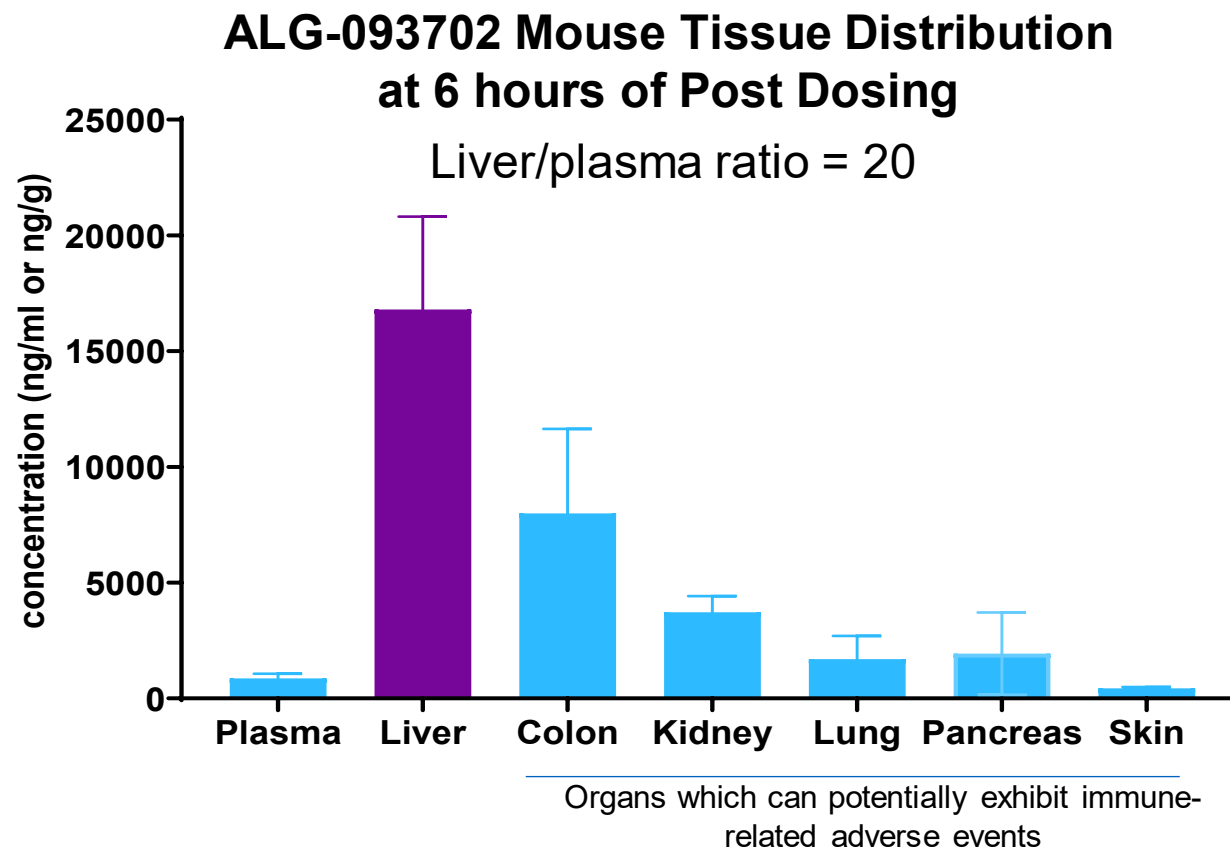
|                                       | Atezolizumab | Durvalumab | ALG-093702 |
|---------------------------------------|--------------|------------|------------|
| PD-L1 reduction EC <sub>50</sub> (nM) | No effect    | No effect  | 1.5        |

ALG-093702 can reach similar PD-L1 target occupancy as FDA approved PD-L1 antibodies

ALG-093702 but not the PD-1 or PD-L1 antibodies, reduces cell surface PD-L1

# ALG-093702 Exhibits Liver Targeted Tissue Distribution

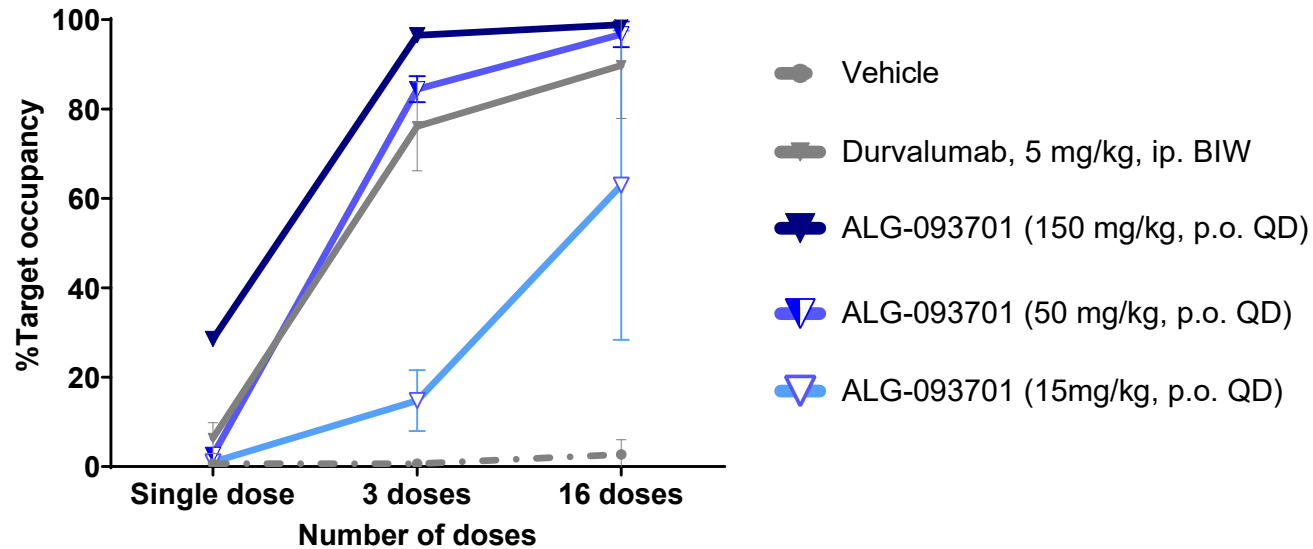
|                                | ALG-093702 Mouse PK        |
|--------------------------------|----------------------------|
| PO Dose (mg/kg)                | 52<br>(Prodrug ALG-093701) |
| T <sub>max</sub> (hr)          | 2.0                        |
| C <sub>max</sub> (ng/mL)       | 1807                       |
| AUC <sub>0-inf</sub> (ng.h/mL) | 8913                       |
| Oral bioavailability           | 41%                        |



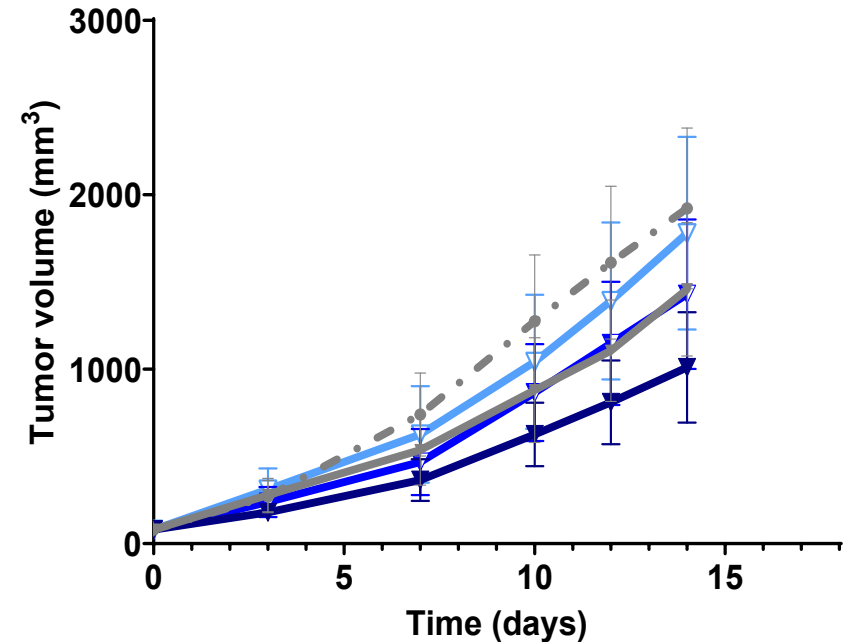
ALG-093702 exhibits significantly higher liver exposure vs. other tested tissues

# ALG-093702 Demonstrated Target Occupancy and Efficacy in a Mouse Sub-Q Tumor Model

## A. In vivo PD-L1 Target Occupancy in a MC38-human-PD-L1 Sub-Q model\*



## B. In vivo Tumor Growth Inhibition (TGI) in a MC38-human-PD-L1 Sub-Q model

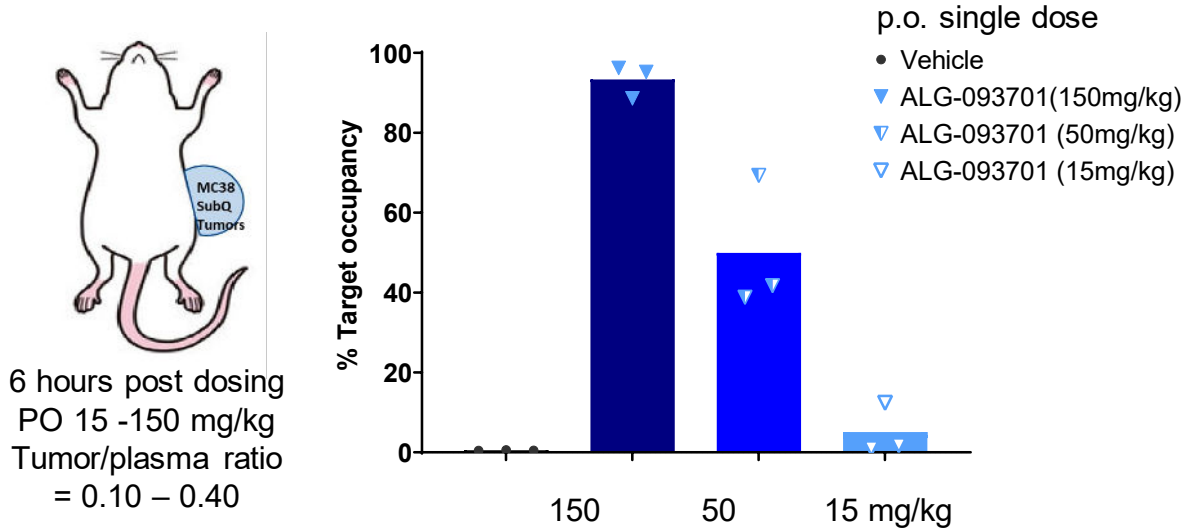


ALG-093702 prodrug (50 mg/kg; PO) can reach similar PD-L1 target occupancy and TGI as durvalumab  
PD-L1 target occupancy is correlated with tumor growth inhibition



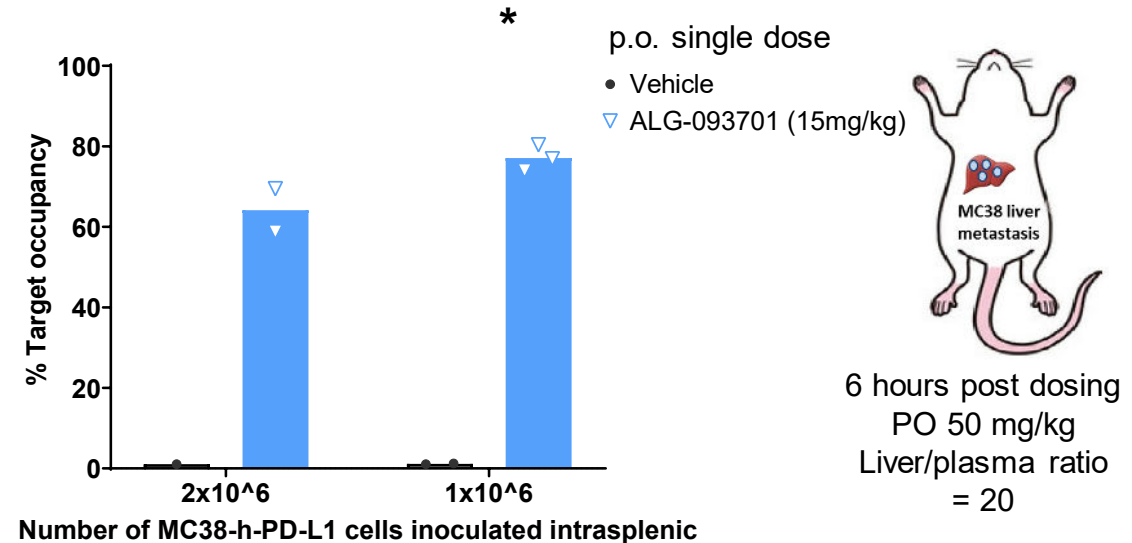
# ALG-093702 Requires a Lower Minimum Efficacious Dose in a Liver Metastasis Model vs. a Sub-Q Model

## A. In vivo PD-L1 Target Occupancy in a MC38-human-PD-L1 Sub-Q model\*



15 mg/kg PO of an ALG-093702 prodrug **cannot** achieve significant PD-L1 target occupancy in Sub-Q tumors

## B. In vivo PD-L1 Target Occupancy in a MC38-human-PD-L1 liver metastasis model

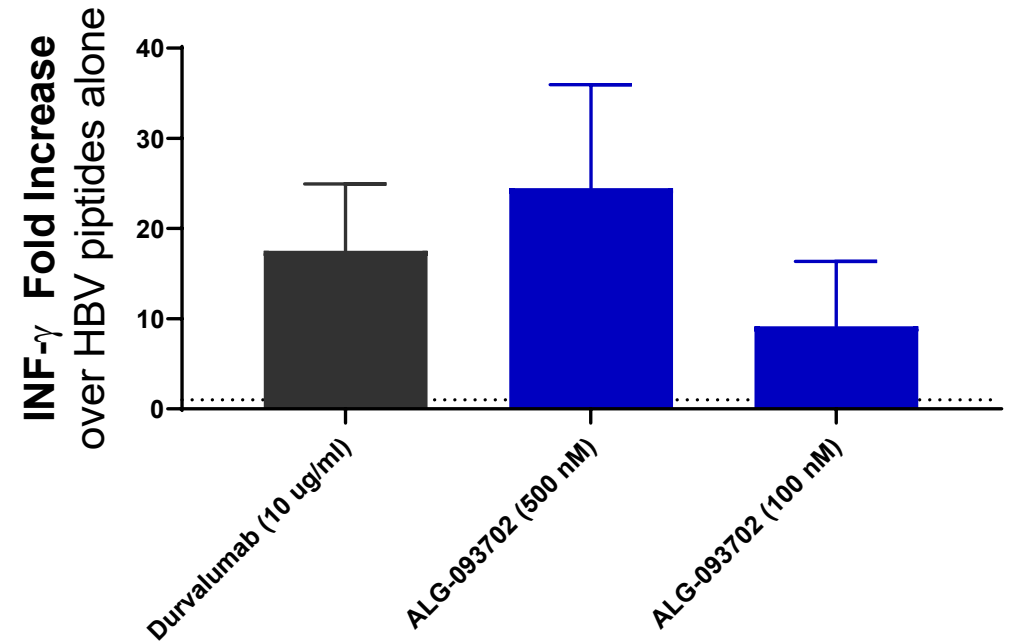
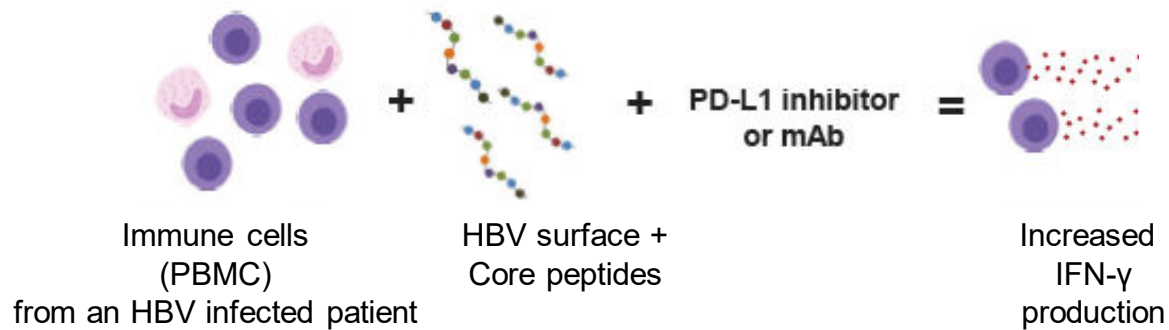


15 mg/kg PO of an ALG-093702 prodrug **can** achieve significant PD-L1 target occupancy in liver metastasis tumors

High ALG-093702 liver exposure might be responsible for the lower minimum efficacious dose in the liver metastasis model vs. Sub-Q model

# ALG-093702 Reactivates HBV-specific T-cells from an HBV-infected Patient

PD-L1 Inhibitor treatment reactivates the HBV-specific T cell response\*



ALG-093702 reactivates HBV-specific T cells from an HBV-infected patient to a similar extent as durvalumab

# Summary

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- Identified a small molecule PD-L1 inhibitor, ALG-093702, with similar *in vitro* and *in vivo* potency to an FDA-approved PD-L1 antibody
- ALG-093702 blocks PD-1/PD-L1 interaction and reduces cell surface PD-L1
- ALG-093702 demonstrates higher liver exposure vs. other tested tissues
- ALG-093702 requires a lower minimum efficacious dose in a liver metastasis model vs. a sub-Q model
- ALG-093702 reactivates HBV-specific T cells from an HBV-infected patient to a similar extent as durvalumab

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