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Technology/ Title	DBPR807/ A CXCR4-Targeted Antagonist- For Cancer Treatment	
Subtitle	Therapeutic Application of CXCR4 Antagonist DBPR807 Combined with Sorafenib in Hepatocellular Carcinoma	
Technology Type	☐Biotechnology	☐Device/Diagnostics
	■Pharmaceutical	☐Others:_____
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Link	http://ibpr.nhri.org.tw/en/wp-content/uploads/2019/03/NEW-2019_NCR-of-DBPR807_20190306.pdf	
Technology Description	➤ When DBPR807 (15 mg/kg/day) was administered subcutaneously (SC) via an osmotic mini-pump in combination with taking sorafenib (40 mg/kg/day) orally for two weeks in the orthotopic HCC mice model, a significant tumor-inhibitory effect was observed, wherein the tumor size was reduced by 85% after two-week treatment. In contrast, the tumor size was only shrunk by 40% as sorafenib was used alone. On the other hand, DBPR807 in combination with PD-1 antibody significantly reduced tumor size by 95%. In contrast, the tumor size was only shrunk by 57% as PD-1 antibody was used alone. After fine tuning, DBPR807 has worked well twice per week (10 mg/kg, IV). In addition, DBPR807 could prevent lung metastasis. ➤ There are four FDA approved anti-liver cancer drugs on the current market, including sorafenib, regorafenib, lenvatinib and nivolumab, in which the patent right of sorafenib will expire in the spring of 2020; thus, combination therapy of it with DBPR807 has great potential to become the first-in-class anti-liver cancer drug in the near future. Mechanically, sorafenib can inhibit angiogenesis leading to hypoxic microenvironment which is forced to trigger the CXCL12/CXCR4 axis to generate a new angiogenic signaling resulting in the relapse of liver tumor. This is the reason why combining with CXCR4 antagonist like DBPR807 can show synergistic effects. Regarding immunotherapy, as combined with PD-1 antibody, CXCR4 antagonist DBPR807 can not only activate but also enhance infiltration of CTLs (cytotoxic T lymphocytes) to combat/kill cancer cells.	

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Intellectual Property	Patent title: Heterocyclic compounds and use thereof Approval: USA (US10882854), Taiwan (TWI664174), Australia (AU2018208366), Japan (JP6892716), Canada (CA3047146), New Zealand (NZ754272), Russia (RU2756055C2), South Korea (KR102335082), India (IN379503)

	Pending: PCT (application No. PCT/US18/12748, pending) includes Brazil, European Union (7), China, Macao, and Hong Kong.
Key Publications	**1.** Song JS, Chang CC, Wu CH, Dinh TK, Jan JJ, Huang KW, Chou MC, Shiue TY, Yeh KC, Ke YY, Yeh TK, Ta YN, Lee CJ, Huang JK, Sung YC, Shia KS, Chen Y. A highly selective and potent CXCR4 antagonist for hepatocellular carcinoma treatment. Proc Natl Acad Sci U S A. 2021;118:e2015433118.
Business Opportunity	CXCR4 is highly expressed in both tumor and stromal cells in various tumor types; its overexpression is associated with poor prognosis and survival in the contexts of various cancer types. Despite the great enthusiasm for translation of CXCR4 antagonists into clinically approved cancer therapies, the utilization of these agents in solid tumors have been restricted by poor efficacy and safety concerns. These studies fully demonstrate that BPRCX807, a highly selective, safe, and potent CXCR4 antagonist, possesses more in vitro and in vivo efficacy than its marketed counterpart AMD3100 under various HCC settings with supreme benefits on combination therapy, whereby it can significantly synergize with not only antiangiogenic therapy (sorafenib) but also immunotherapy (anti–PD-1) to further extend overall survival.

DBPR807 alone or combination show superior Efficacy as compared to sorafenib or AMD3100 alone.