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JD Bioscience Inc.

주주간담회 / 2025년 3월 28일

보유 파이프라인

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다양한 대사질환(대사이상 관련 지방간염, 암, 염증, 심장질환), 희귀질환 파이프라인 보유

Lead Candidate

Candidate	Indication	Target	Development Phase	Plans for BD
GM-60106	MASH/Fibrosis	HTR	Discovery / Pre-clinical / **Phase 1** / Phase 2	L/O Collaborators
GM-10395	Inflammatory Diseases*/Cancer	PDK	Discovery / Pre-clinical / Phase 1 / Phase 2	L/O Collaborators
GM-91466	Dravet Syndrome	Confidential	Discovery / Pre-clinical / Phase 1 / Phase 2	L/O Collaborators
JD-ADC payload	Cancer	Confidential	Discovery / Pre-clinical / Phase 1 / Phase 2	Searching Collaborators

*Inflammatory Diseases: Pancreatitis, Inflammatory Bowel Disease, Chronic Kidney Disease, Cardiomyopathy

- **그 외 운동성 섬모 (motile cilia)를 촉진하는 기전의 폐렴 억제제 등 후보물질을 파이프라인에 추가 예정**

임상 2상 IND 신청 : Pre-IND 미팅 수행 및 질의 대응 완료

’24.10.17. Pre-IND 미팅 (type B) 신청

IQVIA

2400 Ellis Drive
Durham, NC 27703
iqvia.com

October 16, 2024
Frank Anania, M.D., (acting Director)
Division of Hepatology and Nutrition (DHN)
Center for Drug Evaluation and Research
10903 New Hampshire Avenue, Silver Spring, MD 20993

RE: Pre-IND number: 174081
Submission of Type B Pre-IND Meeting Information Package for Written Responses Only (eCTD Sequence No. 0002 / Serial No. 0002)

Dear Dr. Anania,

JD Bioscience Inc. respectfully submitting SN0002 to provide the Agency with the requested Pre-IND Type B Meeting Information Package. This package contains the background information required for the Type B Written Responses Only (requested on September 23, 2024 and granted on October 01, 2024).

Should you require additional information regarding this submission, please contact me at GRAUSagent@iqvia.com or via phone at +1 717 419 2287. My backup contact is Sruthi Nandikonda and can be contacted at the same email.

Sincerely,

Lisa Spigelmyer
Director, Regulatory Affairs, IQVIA
Authorized US Agent for JD Bioscience Inc.

’24.11.20. FDA 답신

FDA U.S. FOOD & DRUG ADMINISTRATION

WRITTEN RESPONSES

Meeting Type:	Type B
Meeting Category:	Pre-IND
Application Number:	174081
Product Name:	GM-60106
Indication:	Metabolic associated steatohepatitis (MASH)
Sponsor Name:	JD Bioscience, Inc.
Regulatory Pathway:	505(b)(1) of the Federal Food, Drug, and Cosmetic Act

1.0 BACKGROUND

The Sponsor is developing GM-60106, a HTR2A antagonist, for the treatment of MASH.

The purpose of this meeting is to seek the Agency's agreement and feedback on the development plan, and CMC and non-clinical data supporting the phase 2a clinical trial, JDB-106002, titled, *A Phase IIa, Randomized, Double Blind, Placebo Controlled, Proof of Concept Study to Evaluate the Safety, Efficacy, Biological Activity, and Pharmacokinetics of GM-60106 in Participants with Metabolic Associated Steatohepatitis (MASH).*

2.0 QUESTIONS AND RESPONSES

Questions from the Sponsor are in *italic* text. Responses from the FDA are in **bold** text.

2.1. Chemistry, Manufacturing, Control

임상 1상 시험 결과 요약

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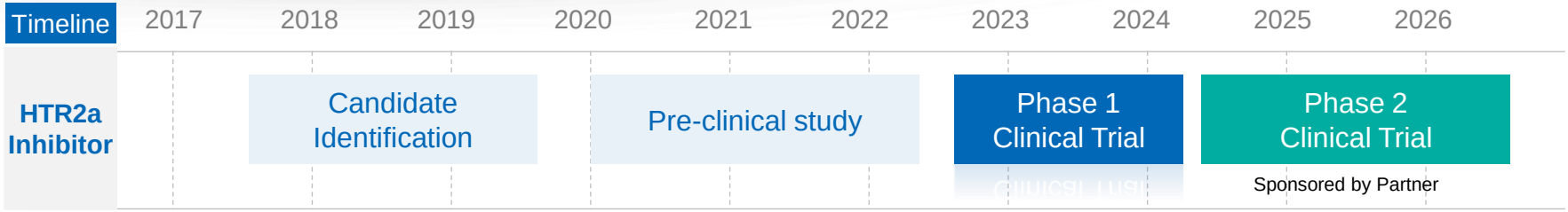

P1 Clinical Trial

96 Participants were dosed with GM-60106

- Pharmacokinetic (PK) exposure in both SAD and MAD cohorts was proportional to the dose.
- GM-60106 was **safe and well-tolerated.**
- **40%** of subjects dosed with 40 mg GM-60106 for 28 days exhibited a **strong reduction in liver fat content (>35%), as analyzed by MRI-PDFF, with no reduction in overall body weight.**

임상 2상 IND 신청

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2025년 3월 28일 미국 FDA IND 신청 완료

Timeline	'24.09	'24.10	'24.11	'24.12	'25.01	'25.02	'25.03	'25.04	'25.05	'25.06
JDB-106002	Synopsis	Protocol Development			Module 1-5		IND application	IND review (1 month)	Revision & IND approval	
	Pre-IND MIP		Pre-IND meeting							

*MIP: Meeting Information Package

IND Submission

'25.01.31

- Non Clinical Module (**M2.4, M2.6**)
- Clinical Summary (**M2.5**)
- CMC (**M3**)

'25.02.28

- Clinical study Reports (**M4**)
- Protocol ICF, PI CV (**M5**)
- Administration (**M1**)

'25.03.28

- **Publishing Activity (E-CTD)**

임상 2상 IND 신청 : 언론보도 결과

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기술마케팅 성과 창출을 위해 연구개발 결과를 다양한 언론 매체를 통해 홍보

BIOSPECTATOR

JD바이오, 'HTR2A 저해제' MASH 2상 "美 IND 신청"

MASH환자 90명 대상 '간지방·섬유화' 등 PoC 평가

제이디바이오사이언스(JD Bioscience)는 대사이상관련 지방간염(MASH) 치료제로 개발중인 HTR2A 저해제 'GM-60106'의 글로벌 임상2a상 임상시험계획서(IND)를 미국 식품의약국(FDA)에 제출했다고 3일 밝혔다.

제이디바이오는 지난해 11월 미국 FDA와의 사전미팅(pre-IND)을 마치고 글로벌 임상시험수탁기관(CRO)인 아이큐비아(IQVIA)와 협력해 미국 임상을 준비해왔다.

이번 임상2a상은 MASH 환자 90명을 대상으로 GM-60106의 안전성, 유효성, 생물학적 활성 및 약동학적 특성을 평가하는 개념입증(proof of concept, PoC) 연구로, 미국내 다수의 임상시험 기관에서 실시할 예정이다.

임상시험은 총 12주간 위약군과 비교평가하며, 주요 효능지표는 자기공명영상 양자밀도 지방분율(MRI-PDFF)을 활용한 간내 지방함량 감소효과다. 또한 탐색적 효능지표로 간 섬유화 정도를 측정할 예정이다. 회사는 이번 2a상 IND를 올해 상반기 중 승인받을 수 있을 것으로 예상하고 있다.

제이디바이오 관계자는 "IND 승인 이후 성공적인 임상시험 수행을 위해 전략적 파트너사를 모색하고 있다"고 말했다.

제이디바이오는 지난 1월 GM-60106으로 진행중인 호주 임상1상의 최종결과를 발표한 바 있다. 임상1상은 국가신약개발사업단(KDDF) 국가신약개발사업의 지원을 받아 수행중이다.

언론보도 결과 : GM-60106, Earns Awarded Distinguished Abstract at 2024 and 2025 MASH-TAG

Selected as
Distinguished Abstract In MASH-TAG Conference In January 2024 and 2025

BioSpectator

JD Bio, 'HTR2A inhibitor' MASH preclinical results "presented at the NASH-TAG conference"

[NASH-TAG 2024] HTR2A inhibitor 'GM-60106' improves symptoms such as liver fibrosis and liver steatosis in mouse models. "Phase 1 clinical trial is expected to be completed in March."

JD Bioscience announced on January 22 that it presented the preclinical results of the company's MASH treatment candidate GM-60106 at 'NASH-TAG 2024', a conference specializing in metabolic dysfunction-associated steatohepatitis (MASH, formerly NASH) held in Park City, the United States from the 4th to the 6th.

GM-60106 is an oral HTR2A inhibitor, and JD Bio confirmed that the administration of GM-60106 in the MASH animal model improved symptoms related to MASH, such as liver fibrosis and steatosis.

보유 파이프라인

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후속 파이프라인 GM-10395 화합물은 염증성 장질환 치료제 후보물질로서 전임상 단계임

Lead Candidate

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- **그 외 운동성 섬모 (motile cilia)를 촉진하는 기전의 폐렴 억제제 등 후보물질을 파이프라인에 추가 예정**

질환타겟 단백질 발굴

KDDF 국가신약개발재단 Korea Drug Development Fund

보건복지부 한미혁신성과 창출 R&D 사업 (실사단계)

경북대 의대와 다 년간의 공동연구를 통해 면역세포 기능조절을 통한 염증성 질환 치료 방법을 개발

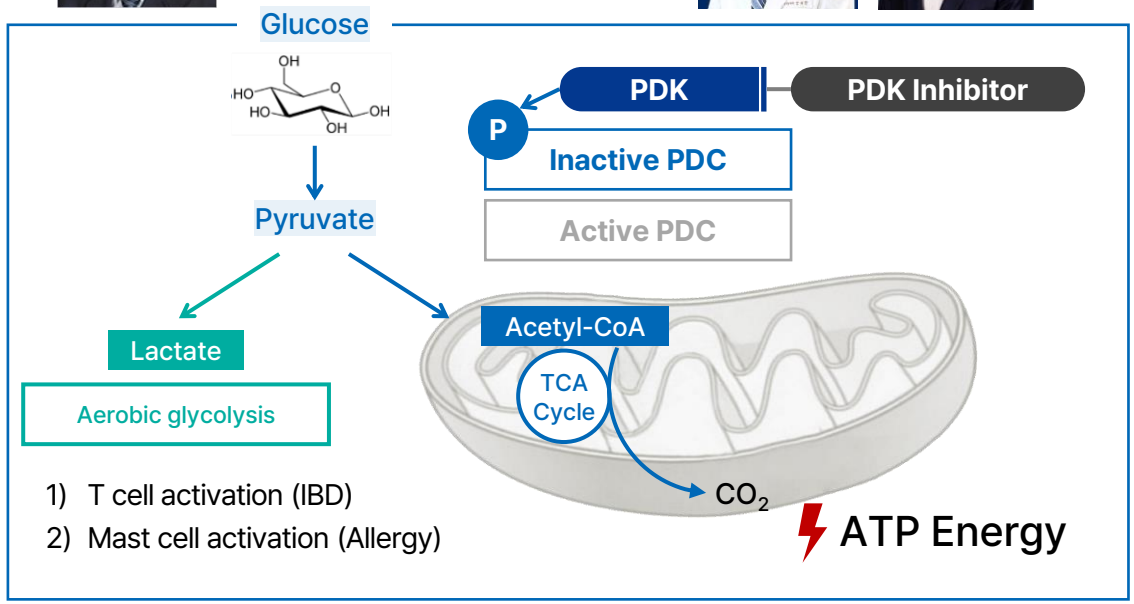
이인규 교수
M.D. / Ph.D.

경북대학교병원 내분비내과 /

대한당뇨병학회 회장 역임

전재한교수
M.D. / Ph.D.

George King, M.D.
하버드 의대



다년간의 기초연구를 통해 면역세포 내 미토콘드리아와 조직 내 염증 간의 연관성을 발견하였으며,
이 과정에서 PDK4 단백질이 주요한 질환 타겟임을 확인함

질환타겟 단백질 발굴

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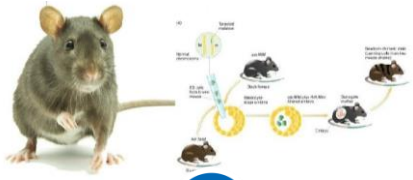
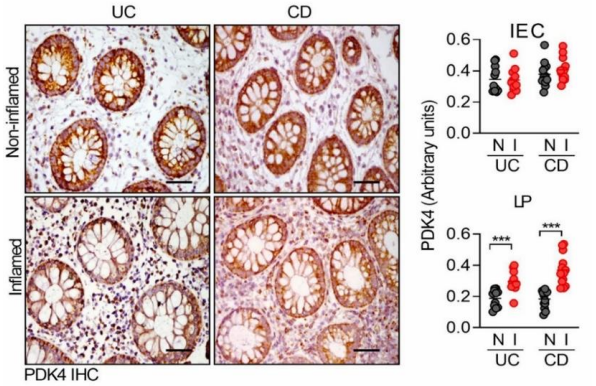
타겟발굴: 염증성 장질환(IBD) 환자샘플 분석과 동물시험을 통해 타겟 단백질인 PDK4을 확정 (First-in-class)

IBD 환자

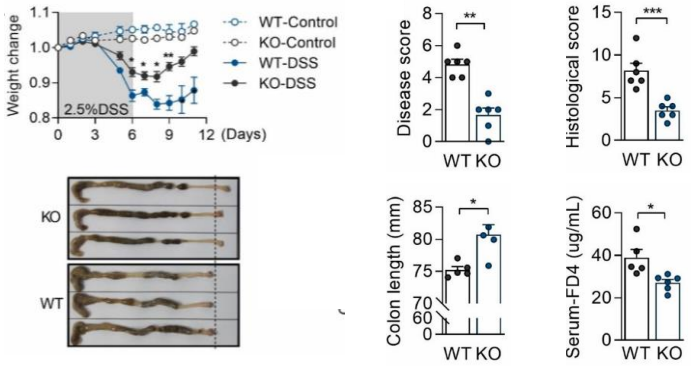
PDK K/O 마우스



PDK4 발현 양상 확인 (IBD 환자)



PDK4 K/O 마우스에서 IBD 질환마커 감소 확인



염증성 장질환 환자 샘플과 동물모델(DSS-induced colitis model) 장 조직에서 PDK4 발현이 증가됨을 확인

PDK4가 결핍된 동물모델에 IBD를 유발해본 결과 조직학 점수, 대장 길이, 장 투과도가 모두 현저히 개선됨

전임상 후보물질 개발

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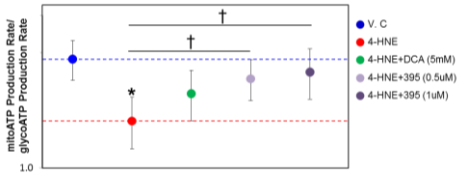
PDK4 타겟에 최적화된 신약후보물질(GM-10395) 개발에 성공_경구용 약물의 요건을 충족

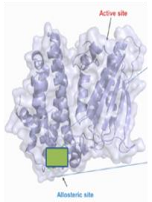
Code	Inhibitor Class
GM-10395 	Allosteric inhibitor

In vitro (cellular Assay)	Recovery of mitochondria function
IC50 44 nM Inhibition of PDHE1α Phosphorylation 159nM(IC50)	 GM10395 recovered Mitochondria function with Dose dependent manner

CYP inhibition (IC50 μM)	HERG inhibition
IA2: 33.69 2C9: 12.64 2C19: 12.18 2D6: 7.94 3A4: 7.72	32.8% at 10μM

PPB	Plasma stability (4hr incubation)	AMES test	Acute toxicity
99.3%(m) 99.5%(m)	Human 89%	Negative	LD50> 1000mpk

In vivo PK	In vivo IBD study	In vivo Anti-cancer efficacy	In vivo efficacy (anti-diabetes)
IV(5mpk) Ora (10mpk) T1/2: 5.15h AUC:1.76 μg/ml(IV) BA: 48%	Improved histological Score colon length In vivo at 1mpk	Reduced tumor Volume In xenograft mice At 1 mpk dose	Glucose AUC reduction (OGTT) Oral administration

Co-crystal Structure (진행중)


보유 파이프라인

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JD-ADC는 신규한 Antibody-Drug Conjugate 기반 치료제로서 신규 파이프라인으로 개발 중

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GM-91466_Target Selection and Validation

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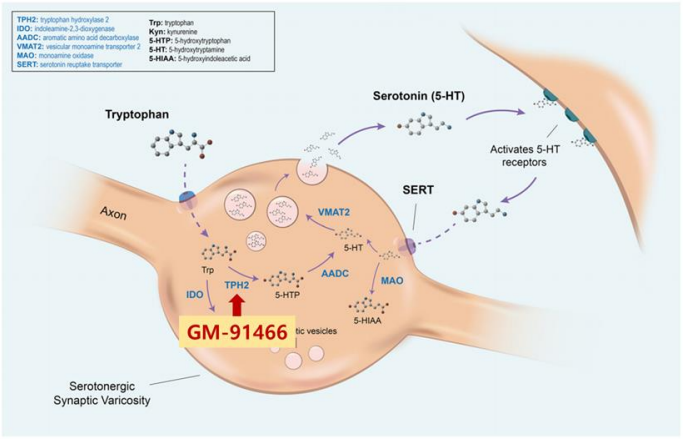
Identified a compound that has better efficacy and safety than FDA approved drugs

Myung Ae Bae, Ph.D.

KRICT Korea Research Institute of Chemical Technology

Screening, Korea Research Institute of Chemical Technology



Step1

6,566 small molecules

Korea Chemical Bank

$C_{13}H_8ClFN_2O_2S$ (GM-90432)

Step2

120 small molecules

Structure-Activity Relationship (SAR)

GM-91466

Pentylenetetrazole (PTZ)-induced seizure model

Genetically modified seizure model (Dravet syndrome)

세로토닌 기능이 **신경계 질환**에 매우 중요한 영향을 미치며, **TPH2**는 **간질성 발작에 결정적인 역할**을 함

GM-91466 Overview

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- GM-91466 exhibits therapeutic potential for Dravet Syndrome, as supported by our preliminary data.
- PK value suggests that it is a suitable candidate for development into an orally administered drug.
- Efficacy of GM-91446 was compared with positive controls and represented strong efficacy.
- Showed entrance into the blood brain barrier.
- MOA is TPH-2 upstream signaling of serotonin pathway

보유 파이프라인

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ADC 공동연구 (Payload)

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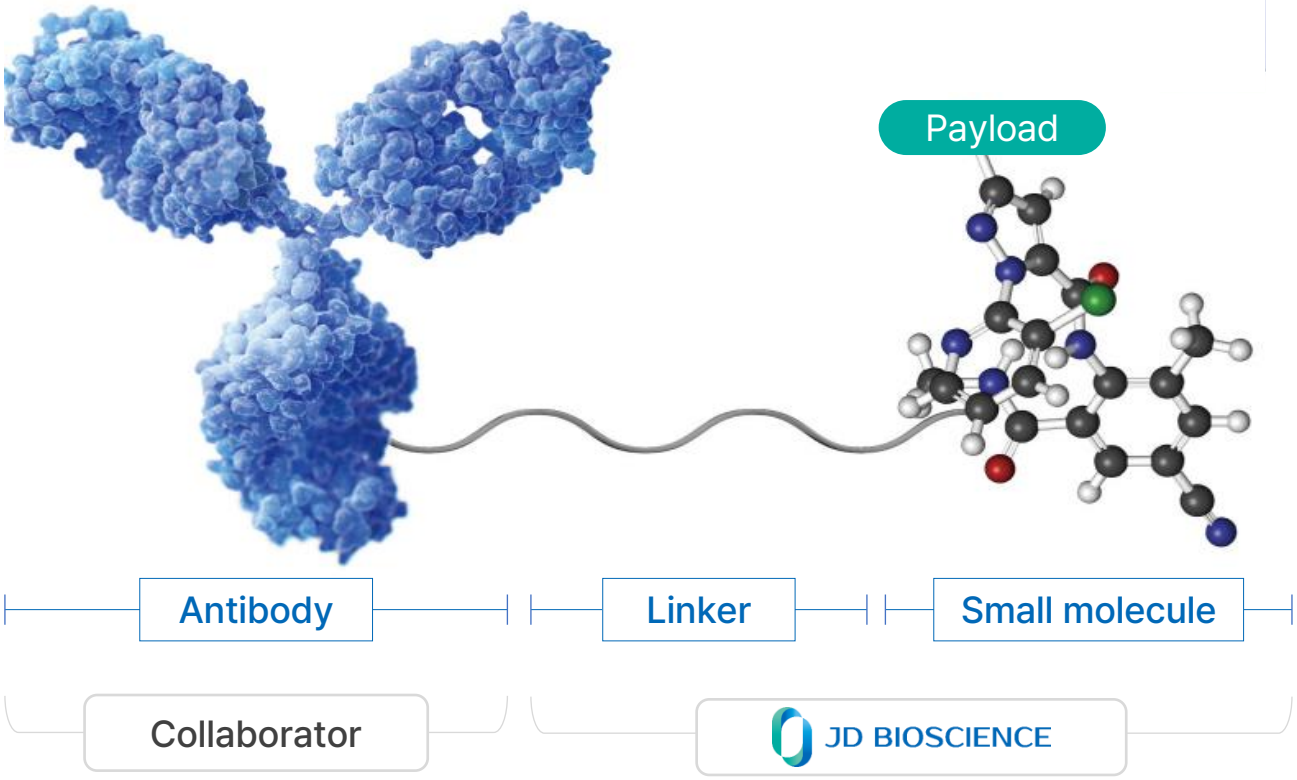
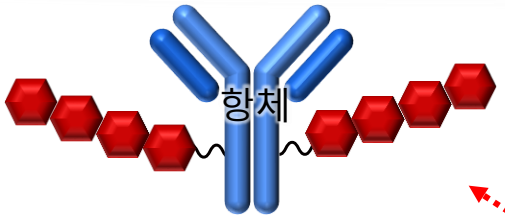
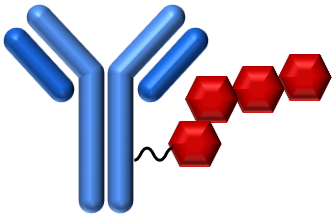
항체치료제 전문기업과 함께 협업을 통해 최적의 ADC 치료제 개발이 목표



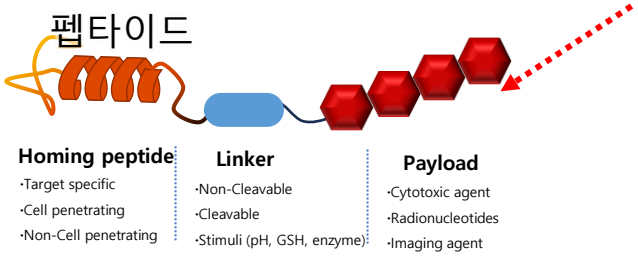
제이디바이오사이언스 의약화학연구의 정체성·방향성



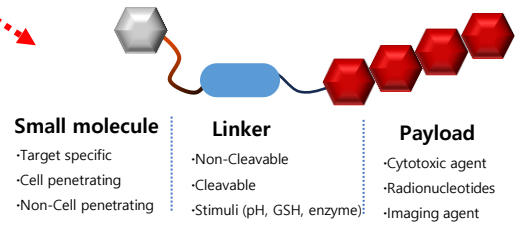
ADC
Antibody drug conjugate



TPD & DAC
Targeted protein degrader
Degrader antibody conjugate



PDC
Peptide drug conjugate



SMDC
Small molecule drug conjugate

신규 ADC 개발을 위한 협업관계 구축

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항체 치료제 전문 기업 등과 ADC 공동개발 또는 페이로드 기술이전을 전제로 협업진행 중

신규 ADC 개발

JD BIOSCIENCE

Medicinal Chemistry
(Design, Synthesis, SAR, Optimization)

ADC 개발 社와 collaboration

To discover novel therapeutics for metabolic disease with
unmet medical needs that help people live longer and healthier

감사합니다

801ho, TJS knowledge industrial center 17-23,
Cheomdangwagi-ro, 208 beon-gil, Buk-gu, Gwangju, South Korea

www.JDBIOSCI.COM | +82-62-974-9380

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