

KS-V Peptide Structural Biology Services

www.ks-vpeptide.com

About Our Structural Biology Platform

KS-V Peptide has an expert team of structural biologists with strong academic and industrial experience and can offer high-quality structural biology services to pharmaceuticals, biotechnology companies, and research institutions. Our team's expertise and state-of-the-art technology allow us to provide unparalleled services that meet the needs of our clients.

Our Instruments

● NMR (Nuclear Magnetic Resonance) platform



Agilent VNMRS 700 MHz
NMR Spectrometer



Bruker Avance-III 600MHz
NMR Spectrometer



Bruker Avance-Neo 600MHz
NMR Spectrometer

● Cryo-EM (Cryogenic electron microscopy) platform



FEI Vitrobot
System



FEI Tecnai T12
120 kV TEM



FEI Tecnai G²
200 kV cryo-TEM



Titan Krios G3i
300 kV cryo-TEM



Glacios 200 kV
cryo-TEM

Our Advantages



Advanced equipment



Professional team



High-quality service

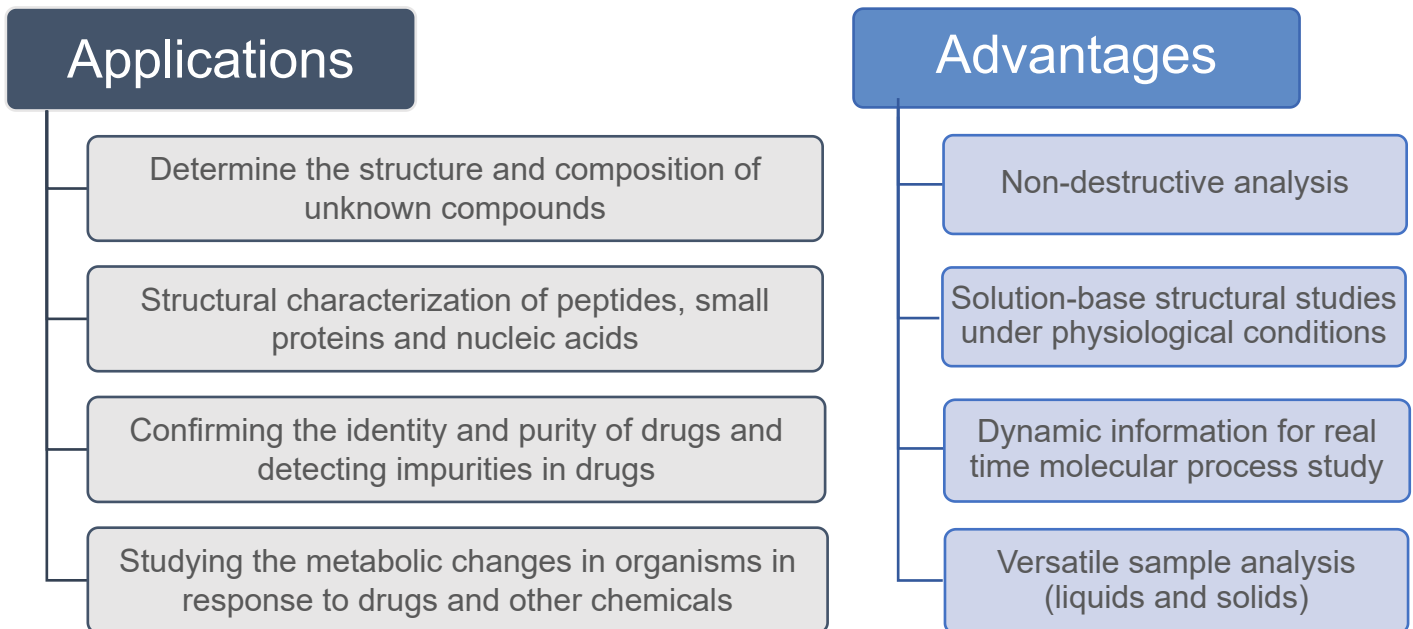


Fast delivery

NMR Platform

Nuclear Magnetic Resonance (NMR) technology is a powerful tool in molecular biology and biochemistry for studying the structure and dynamics of molecules. It provides high-resolution information about molecular structure (including atomic and chemical details) non-invasively, NMR study of molecules in solution gives insights into the dynamic behavior of molecules in their natural state, and its high-resolution data allows accurate molecular characterization.

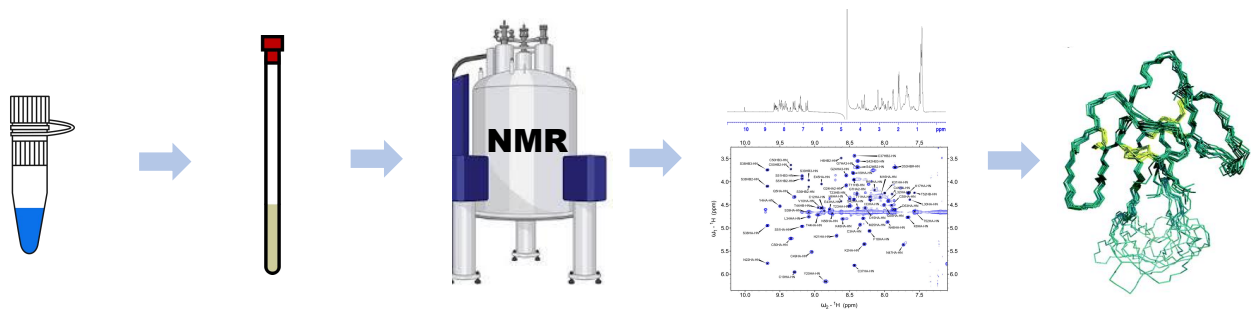
Why do you need NMR?



Why choose our NMR services?

- Our NMR platform is equipped with state-of-the-art NMR instruments, including one 700 MHz and two 600 MHz NMR spectrometers, allowing for accurate and detailed molecular characterization.
- Our NMR services are carried out by highly trained and experienced professionals who have a deep understanding of NMR technology and the applications of NMR spectroscopy.
- We can offer a wide range of NMR services to support various life sciences research projects, from basic research to drug discovery. Services can be offered to Good Laboratory Practice (GLP) or Good Manufacturing Practice (cGMP) if required.
- Our experts will work with you to tailor a solution that fits your research needs.

NMR Workflow



Peptide synthesis & Protein preparation

NMR sample preparation

NMR data acquisition

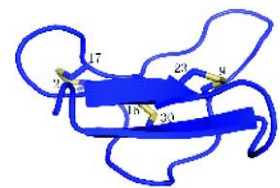
NMR data processing

Structural analysis

Our Service Guide

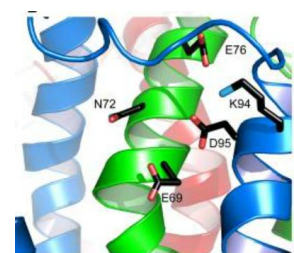
Structural characterization

- Structural identification of natural products, organic synthetic intermediates or byproducts, drug metabolites, and drug impurities
- Three-dimensional structure analysis of peptides and proteins



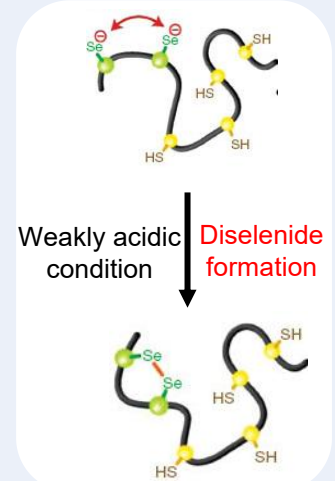
Protein-ligand/protein interaction studies

- Protein-ligand/protein interaction
 - Binding affinity measurement
 - Binding sites analysis
- Drug discovery and screening



Drug quality control

- Qualitative identification of drugs
 - Evaluation of the consistency of generic drugs and the similarity of biosimilar drugs, and analysis of peptide drugs (including conformational impurities and disulfide bond analysis)
- Identification and inspection of drug impurities
- Drug authenticity identification

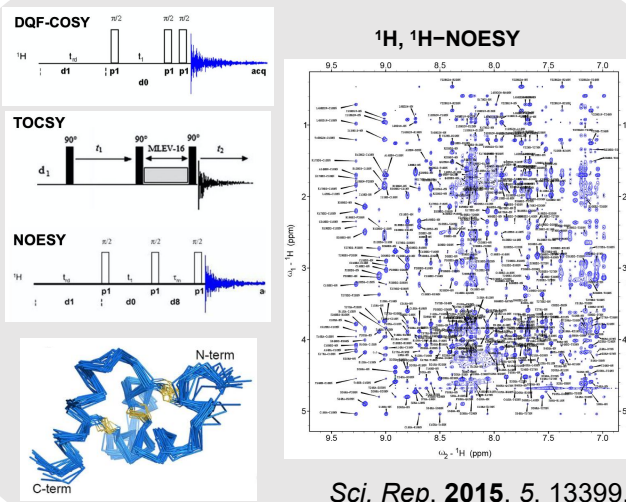


Case Study: NMR Data Solved by KS-V

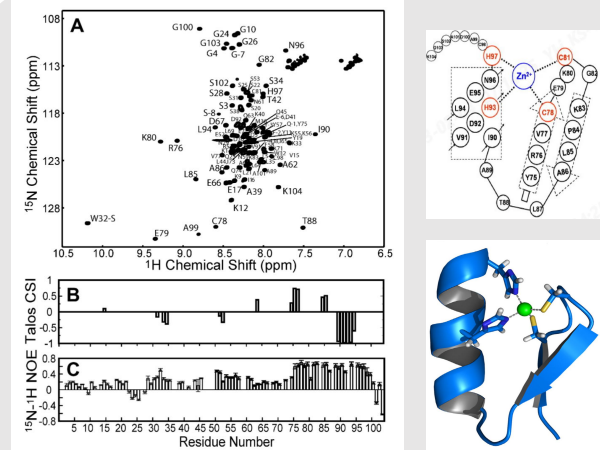
● Structure determination - 3D structure of peptide and small protein

Solution NMR analysis of toxin SSD609
(47 amino acids)

Solution NMR characterization of
Sgf73(1-104) (105 amino acids)



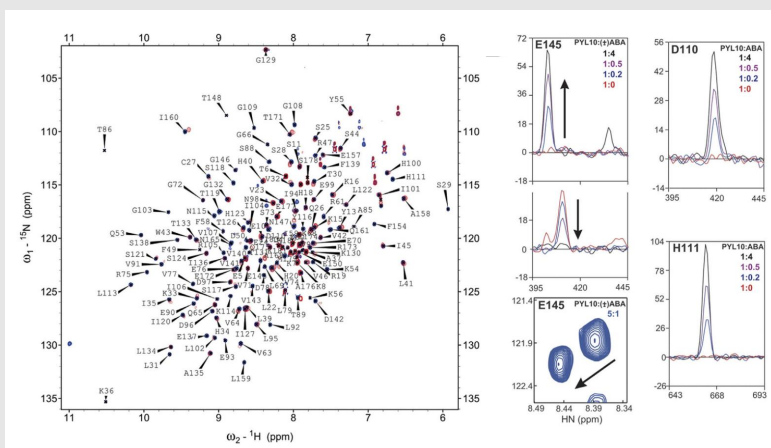
Sci. Rep. **2015**, *5*, 13399.



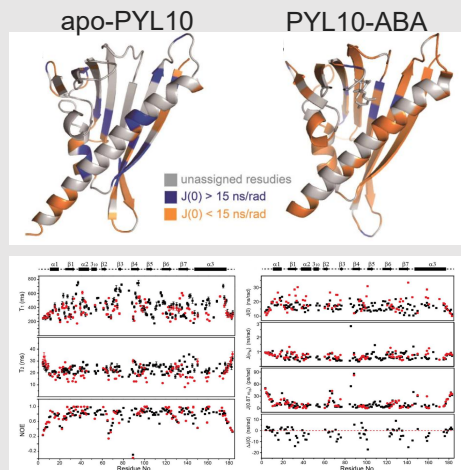
Biochem. Bioph. Res. Co. **2010**, *397*, 436-440.

● Protein - ligand interaction analysis

Solution NMR relaxation and dynamic analysis of PYL10 in the absence of presence of ABA



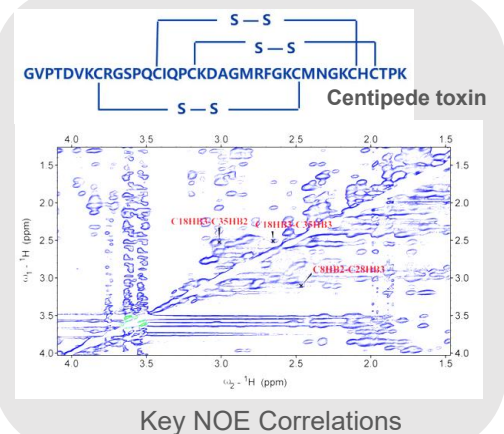
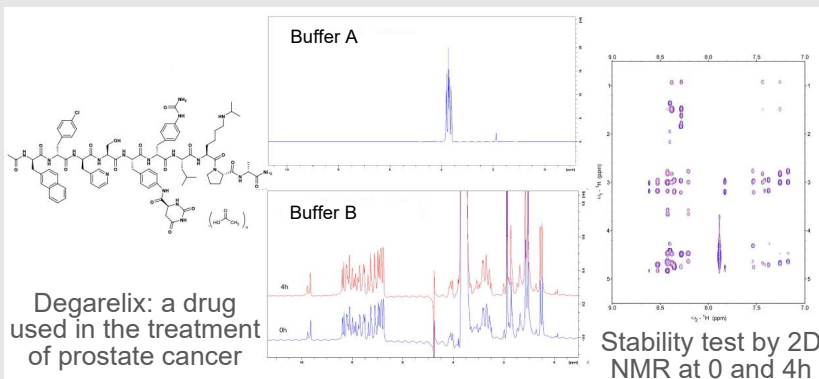
Sci. Rep. **2015**, *5*, 10890.



● Drug quality control - structure identification and quantification

Solubility analysis in different buffers and structural consistency evaluation

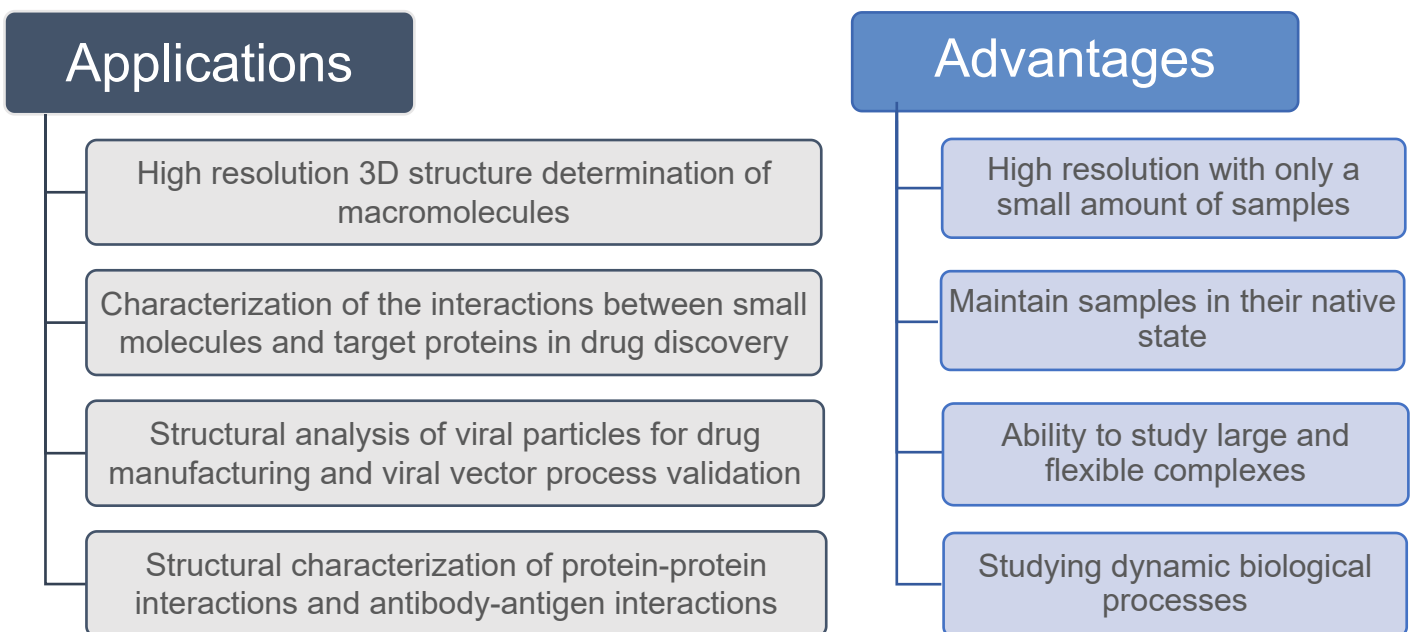
Disulfide Bond Validation



Cryo-EM Platform

Cryo-electron microscopy (cryo-EM) is a revolutionary technology in the field of structural biology. Combining with 3D reconstruction techniques, it allows acquisition of near-atomic resolution protein structures by rapidly freezing biological samples and using electron beam irradiation. Cryo-EM avoids the need for protein crystallization and is ideal for investigating the structures of membrane proteins (such as ion channels, GPCRs, and transporters) and large protein complexes, which are often challenging to crystallize.

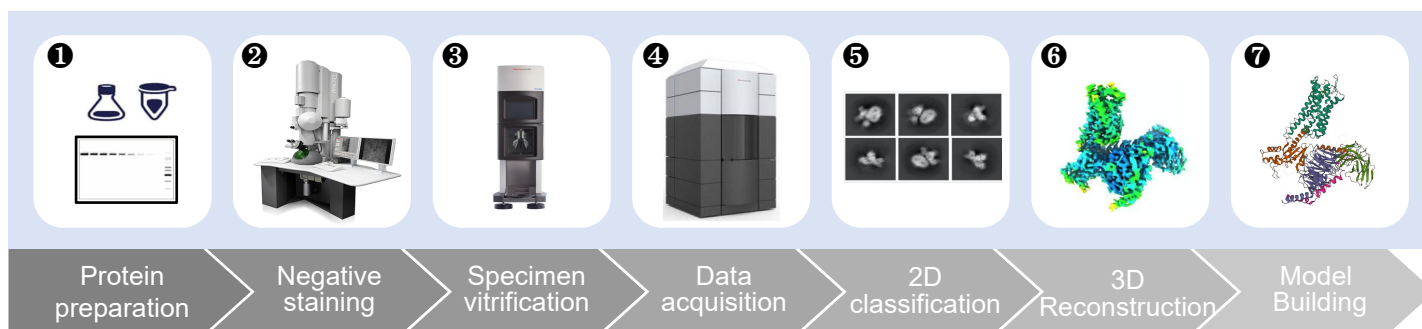
Why do you need cryo-EM?



Why choose our cryo-EM services?

- Our cryo-EM platform has advanced microscopes including one Titan Krios and one Glacios.
- We have an expert team with strong expertise in structural biology, protein science and computation.
- We can offer one-stop protein structural biology services from gene synthesis to cryo-EM structure.
- We have extensive experience in challenging proteins preparation such as membrane proteins, ion channel proteins, GPCRs, and many state-of-the-art techniques for obtaining and stabilizing protein complexes.

Cryo-EM Workflow



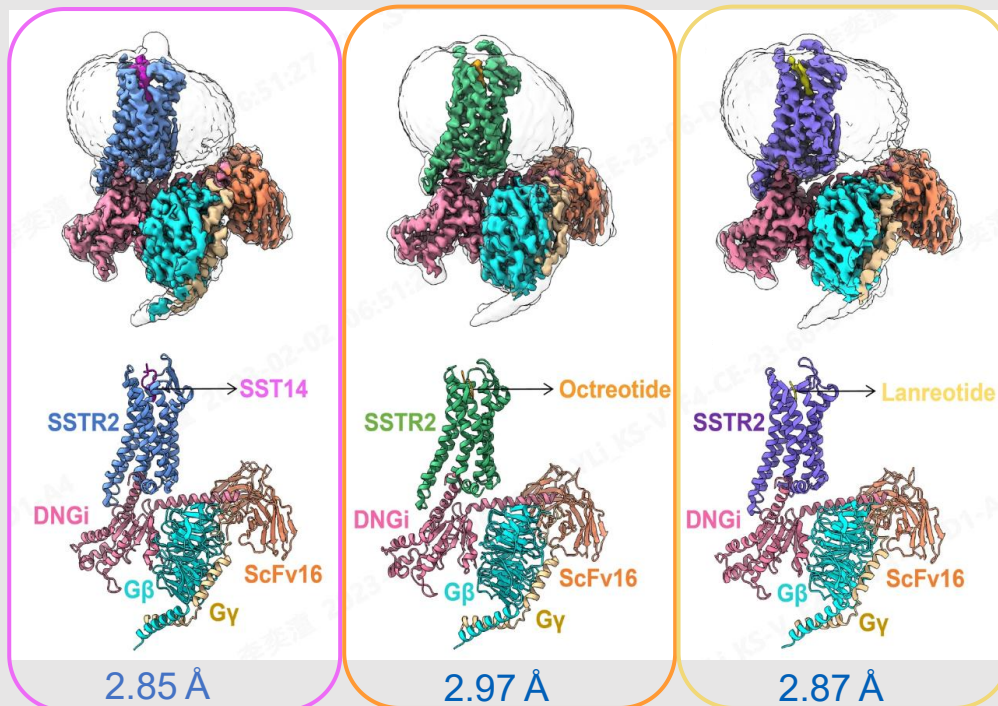
Our Service Guide

Service item	Process description	Timeline	Deliverables
Protein preparation	We can provide construct design, gene synthesis, protein expression, and protein purification based on your demands.	Depends on samples	Quality control data of purified proteins, such as SDS-PAGE, size-exclusion chromatography
Negative staining	Negative stain sample preparation and TEM examination Assess sample homogeneity	1 week	Sample quality report including 5-10 micrographs of negative stain sample
	Negative stain image collection and 2D classification analysis Further evaluate particle size and shape	2 weeks	Particle analysis data including information on the size and shape of the particles
Sample vitrification	Rapid freezing sample using FEI Vitrobot system and vitrification optimization with different grids and blotting conditions. Collect a small amount of data to assess the quality of the vitrified samples.	2-3 weeks	Sample vitrification process report including information on the condition used and data including 2D images to evaluate the quality of the samples.
Data acquisition	Data acquisition using Tian Krios 300 kV cryo-TEM	1-2 weeks	
Data processing	Data processing including motion correction, CTF estimation, particle picking, 2D classification, 3D reconstruction, model refinement and model validation	Depends on the data quality and the analysis complexity.	We can provide raw datasets, processed data including 2D class averages, 3D density maps, and 3D structure models.
Model building	De novo modeling using high resolution density map		

Case Study: Cryo-EM Structures Solved by KS-V team

- **Structural insights into the activation of somatostatin receptor 2 by cyclic SST analogues**

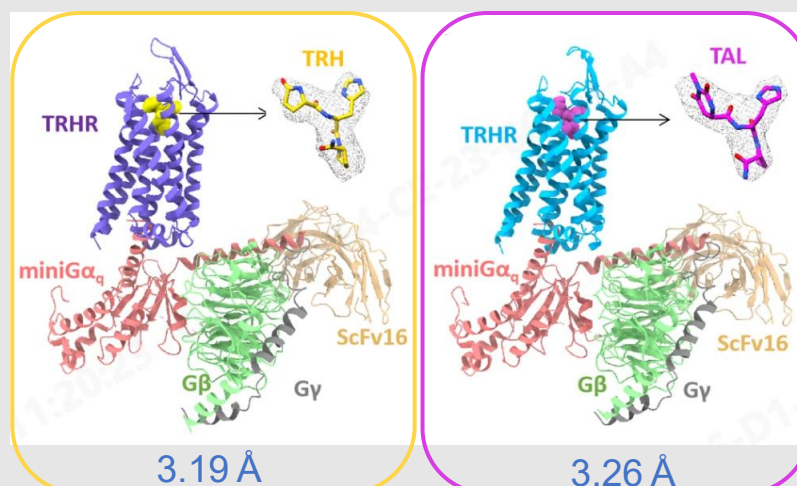
Cell Discovery, 2022, 8, 47.



- SSTR: class A G protein-coupled receptors (GPCRs)
- SST14: a cyclic hormone release-inhibiting peptide
- Octreotide and lanreotide: SST14 analogues, commercial drugs to treat acromegalia and NETs

- **Structural insights into thyrotropin-releasing hormone receptor activation by an endogenous peptide agonist or its orally administered analogue**

Cell Discovery, 2022, 32, 858-861.

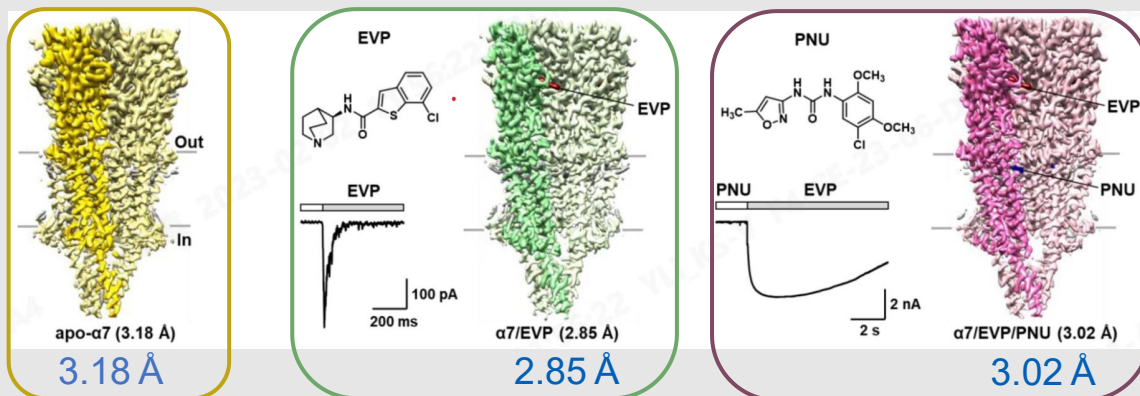


- TRHR: class A G protein-coupled receptors (GPCRs)
- TRH: thyrotropin-releasing hormone, a tripeptide (Glu-His-Pro)
- TAL: taltirelin, TRH analog, commercial drug to treat spinocerebellar ataxia

Case Study: Cryo-EM Structures Solved by KS-V team

● Structural basis of human $\alpha 7$ nicotinic acetylcholine receptor activation

Cell Discovery, 2021, 31, 713-716.



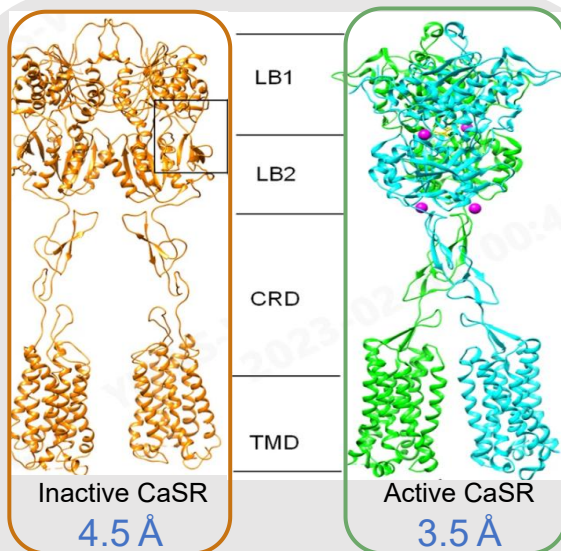
- $\alpha 7$ nAChR: a class of pentameric ligand-gated ion channels (pLGICs)
- **EVP and PNU**: $\alpha 7$ nAChR-selective agonists, both of them are in clinical trials for the treatment of Alzheimer's disease

● Structural mechanism of cooperative activation of the human calcium-sensing receptor by Ca^{2+} ions and L-tryptophan

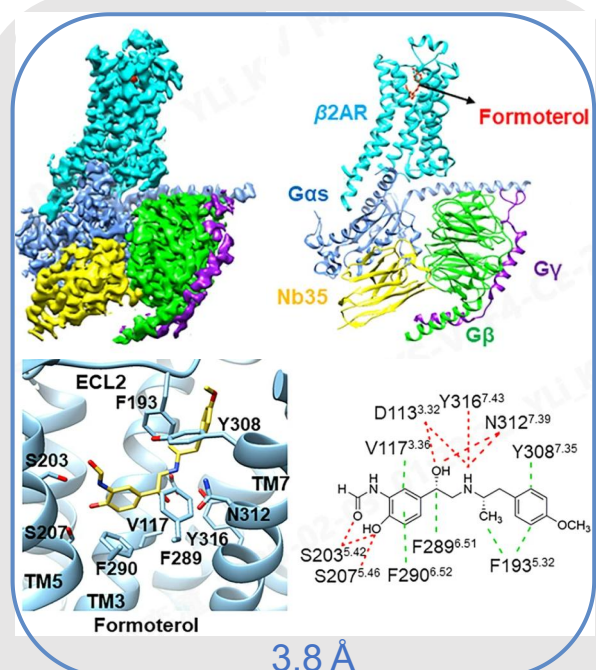
Cell Discovery, 2021, 31, 383-394.

● Single-particle cryo-EM structural studies of the $\beta 2\text{AR}$ -Gs complex bound with a full agonist formoterol

Cell Discovery, 2020, 6, 45.



- CaSR: a class C G protein-coupled receptor (GPCR)
- $\beta 2\text{AR}$: a class A GPCR
- Formoterol: a selective and long-acting agonist of $\beta 2\text{AR}$, used as a bronchodilator in the management of asthma and chronic obstructive pulmonary disease



Partial list of our partners

AMGEN



WuXi Biologics
Global Solution Provider



豪森药业
HANSOH PHARMA



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KS-V PEPTIDE
The Peptide Experts



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***Innovation To Help Drug Research And Development
Cooperation To Promote Healthy Life***