# CK156: A Chemical Probe for DRAK1

Version 1.0 (11th October 2021)

**Web link for more details: https://www.thesgc.org/chemical-probes/CK156**

## Overview

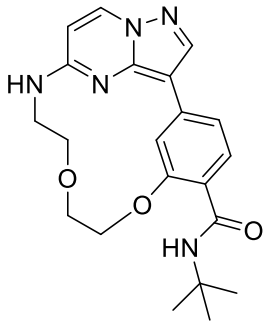
DAP Kinase-Related Apoptosis-Inducing Protein Kinase 1 (DRAK1) is part of the DAPK (death-associated protein kinases) family, which comprises of four members (DAPK1–3 and DRAK2). Both, DRAK1 and DRAK2, belong to the so-called dark kinome and their cellular function is widely unknown. However, recent findings indicate that DRAK1 might play a role in different cancer diseases such as glioblastoma multiforme (GBM) or head and neck squamous cell carcinoma (HNSCC).

## Summary

| | |
|---|---|
| Chemical Probe Name | CK156 |
| Negative control compound | CKJB71 |
| Target(s) (synonyms) | DRAK1 (DAP Kinase-Related Apoptosis-Inducing Protein Kinase 1)/ STK17A (Serine/threonine-protein kinase 17A) |
| Recommended cell assay concentration | Use at concentration of 1 µM (and ≤ 10 µM) for CK156 and CKJB71; use with control for best interpretation of data. |
| Suitability for *in* vivo use and recommended dose | CK156 was not tested in vivo. |
| Publications | |
| Orthogonal chemical probes | |
| *In vitro* assay(s) used to characterise | DSF, ITC, Radiometric inhibition assay |
| Cellular assay(s) for target-engagement | NanoBRET™ |

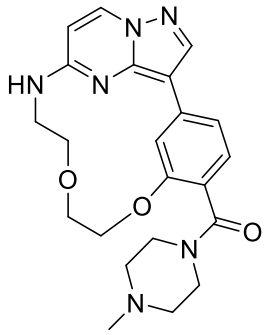
## Chemical Probe & Negative Control Structures and Use

CK156 Chemical Probe



**SMILES:** O=C(NC(C)(C)C)C1=CC=C2C=C1OCCOCCNC3=NC4=C2C=NN4C=C3
**InChiKey**: YCFFONJEHNSECY-UHFFFAOYSA-N
**Molecular weight:** 395.46
**Storage** Stable as solid in the dark at -20°C. NB making aliquots rather than freeze-thawing is recommended
**Dissolution**: Soluble in DMSO up to 10 mM; use only 1 freeze/thaw cycle per aliquot

CKJB71 Negative Control



**SMILES**: O=C(N1CCN(C)CC1)C2=CC=C3C=C2OCCOCCNC4=NC5=C3C=NN5C=C4
**InChiKey**: DDXOMWWURGFLKK-UHFFFAOYSA-N
**Molecular weight:** 422.49
**Storage**: Stable as solid in the dark at -20°C. NB making aliquots rather than freeze-thawing is recommended
**Dissolution**: Soluble in DMSO up to 10 mM; use only 1 freeze/thaw cycle per aliquot

## Chemical Probe Profile

*In vitro* Potency & Selectivity:

The binding of CK156 towards DRAK1 was determined by DSF (11.3 K) and confirmed by ITC with an $K_D$ of 21 nM. The potency of CK156 was determined on a radiometric assay $^{33}$PanQinase Activity Assay (ProQinase) with an $IC_{50}$ of 49 nM at an ATP concentration of 0.1 µM. CK156 has been shown to be selective in the scanMAX® Panel from DiscoverX against 468 Kinases at two different concentrations (1 µM and 100 nM). The closest cellular off-target was BMP2K ($IC_{50}$ = 8 µM) and STK17B ($IC_{50}$ = 8 µM).

Potency in Cells and Cellular Target Engagement:

In NanoBRET assay using HEK293T cells CK156 displayed an $IC_{50}$ of 181 nM in intact cells respectively 69 nM in the lysed cells.

The cytotoxicity of CK156 was assessed in a high content screen using a confocal microscope (CQ1, Yokogawa) measured in three different cell lines (HEK293T, U2OS and MRC-9 fibroblasts). CK156 showed no cytotoxicity up to 10 µM in HEK293T and MRC9 cells and just minor cytotoxicity at 10 µM in U2OS cells after 36 h.