

# TRL

## Technology Readiness Level

Technology Readiness Level is a standardized measurement system to assess the maturity level of a particular technology. TRL was originally conceived by NASA and later adopted widely by industry as well as many public institutions (including the European Commission).

There are many ways to describe the 10 levels of readiness – here is one that we find make sense for commercialization of academic research.

When it comes to pharmaceutical research, the drug development- and clinical trial phases largely decide the readiness of a drug. Luckily, the two scales are somewhat compatible and correspond as follows:

TRL PHASE	TRL	TRL DESCRIPTION	DRUG DISCOVERY / CLINICAL TRIAL
IDEA	0	You have an unproven and untested concept.	Basic research
	1	You have observed the basic principles but you have no evidence.	
RESEARCH	2	You have described the concept and you know how to validate it.	Target Identification / Target Validation
	3	First laboratory tests completed. You have experimental proof of concept.	Lead Compound Discovery / Lead Compound Optimization
PROTOTYPE	4	You have tested an early prototype in the laboratory with satisfactory results.	Lead Compound Validation / Preclinical Studies
	5	The prototype is more refined and functions in the intended environment.	Investigational New Drug (IND) application / Phase 0
VALIDATION	6	The prototype works close to expected performance in the intended environment.	Phase 1
	7	You can demonstrate a fully functional system in the operational environment.	Phase 2
PRODUCTION	8	All technical processes to support commercial activity is in ready state. You can manufacture the final solution.	Phase 3
	9	Your technology is generally available for all customers.	Regulatory Approval / Product Launch / Market Monitoring