



SUMO Technology

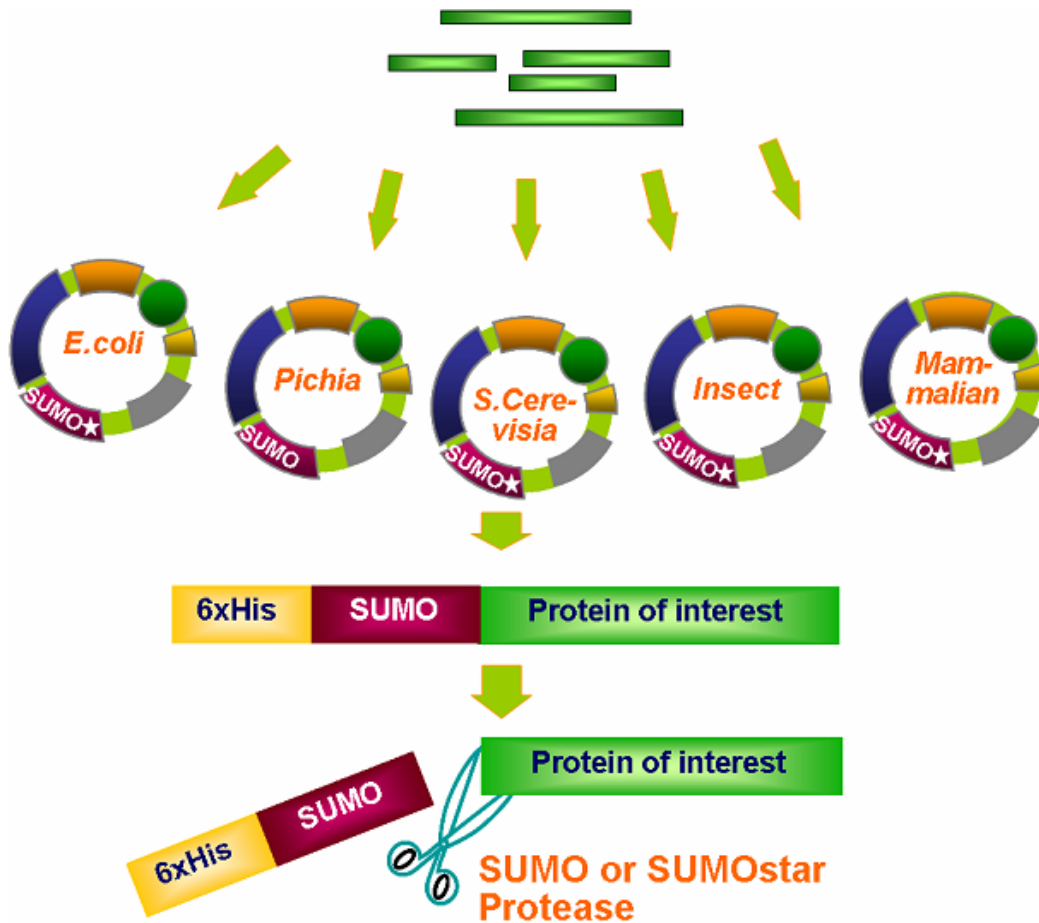


Fusion Tag Protein Expression System

- Tag: SUMO (small ubiquitin-like modifier)
- **Increased expression**
 - SUMO protects proteins from degradation
- **Increased solubility**
 - SUMO helps proteins fold correctly
- **Easy Purification**
 - Both the tag and the protease have 6xHis tags
- **Native/Active Protein**
 - SUMO Protease leaves no unwanted residues on the N-terminus



SUMO is a Universal Tag



PCR of a library

Directional cloning into vectors

Expression and purification by Ni-NTA

Cleavage to yield native/active protein



SUMO Vectors



SUMOpro

- Based on the yeast SUMO
- For expression in E.Coli
- Cleaved by SUMO Protease 1

SUMOpro-3

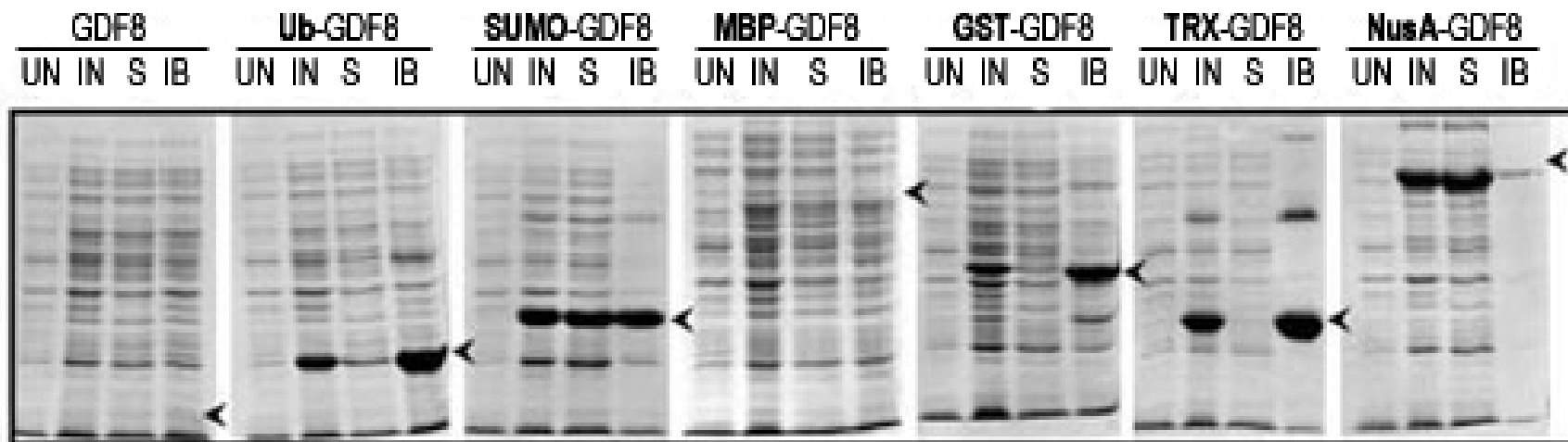
- Based on the human SUMO
- For expression in E.Coli or Pichia Pastoris
- Cleaved by SUMO Protease 2

SUMOstar

- Mutant form of SUMO
- Uncleaveable by endogenous proteases
- For expression in E.Coli, S.cerevisiae, insect, or mammalian cells
- Only cleaved by SUMOstar Protease



SUMOpro® fusion enhances expression and solubility in E. coli



CONDITIONS

UN – Uninduced

IN – Induced

S – Soluble Fraction

IB – Inclusion Bodies

Marblestone et. al., Protein Sci. 2006 Jan;15(1):182-9



SUMO Vector Table



Expression Host	Vector & Cat. Number	Kit Cat. number	Promoter	Selectable Marker in		Tags		Secretory Signal	Map links		Tag cleaved by		
				E. coli	Host	6xHis	SUMO		Seq.	Tag + MCS	SUMO Protease 1	SUMO Protease 2	SUMO star Protease
E. coli	pE-SUMO (Amp) #1001A	#1000A	T7	Amp		+	SUMOpro		[A]	[A]	+		
	pE-SUMO (Kan) #1001K	#1000K	T7	Kan		+	SUMOpro		[A]	[A]	+		
	pE-SUMO3 (Amp) #1016	#1010A	T7	Amp		+	SUMOpro-3		[A]	[A]		+	
	pE-SUMO3(Kan) #1011	#1010K	T7	Kan		+	SUMOpro-3		[A]	[A]		+	
	pE-SUMOstar (Amp) #1106	#1100A	T7	Amp		+	SUMOstar		[A]	[A]			+
	pE-SUMOstar (Kan) #1101	#1100K	T7	Kan		+	SUMOstar		[A]	[A]			+
Yeast	Pichia pastoris pP-secSUMO3 #2151	#2150	AOX1	Zeocin		+	SUMOpro3	+	[A]	[A]		+	
	Saccharomyces cerevisiae pY-SUMOstar #2101	#2100	CUP1	Amp	Trp	+	SUMOstar		[A]	[A]			+
Insect cells	pI-SUMOstar #3101	#3100	Polh	Amp	-	+	SUMOstar		[A]	[A]			+
	pI-secSUMOstar #3106	#3105	Polh	Amp	-	+	SUMOstar	+	[A]	[A]			+
Mammalian Cells	pM-SUMOstar #7111	#7110	CMV	Amp	Neomycin	+	SUMOstar		[A]	[A]			+
	pM-secSUMOstar #7121	#7120	CMV	Amp	Neomycin	+	SUMOstar	+	[A]	[A]			+