Tet Inducible Gene Expression Systems

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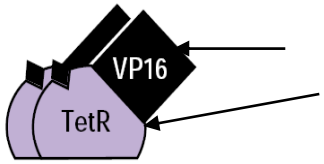
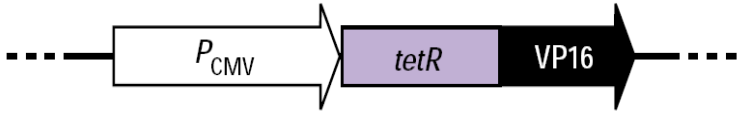
Tet-On® and Tet-Off® Systems

- No pleiotropic effects
- Low to none basal expression
- High expression levels
- High fold-inducibility (ratio of highest to basal expression levels)
- Fast and reversible kinetics
- Precise control
- Non toxic for cell lines and transgenic animals
- Variety of delivery methods

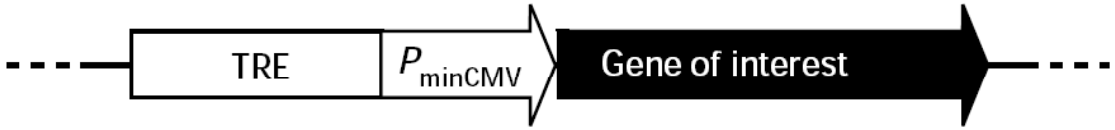
The Tet System
Two-Vector System



Activation Domain
Binding Domain

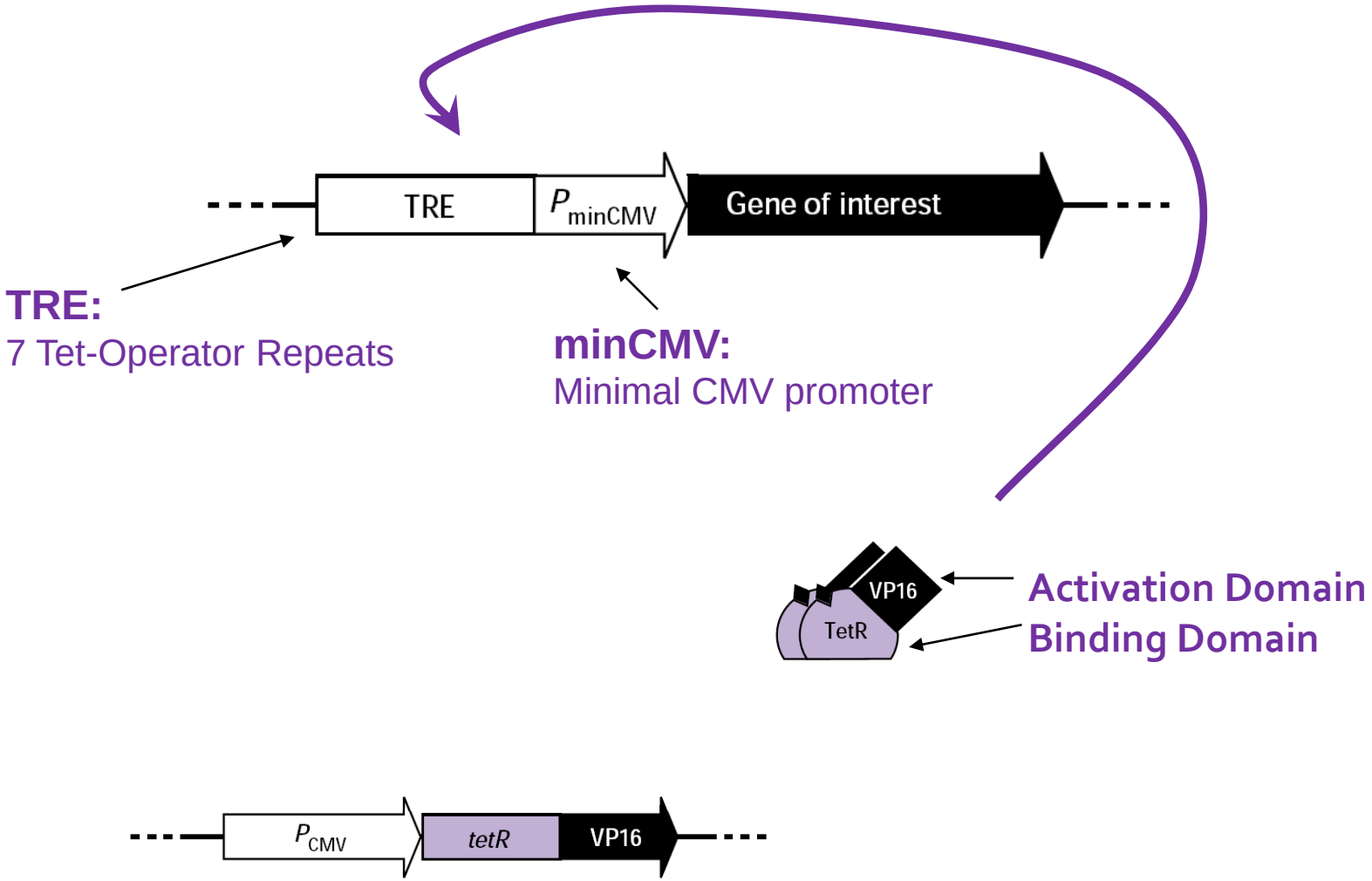


Regulatory Vector constitutively expressing
Tetracycline-controlled Transactivator (tTA, rtTA)



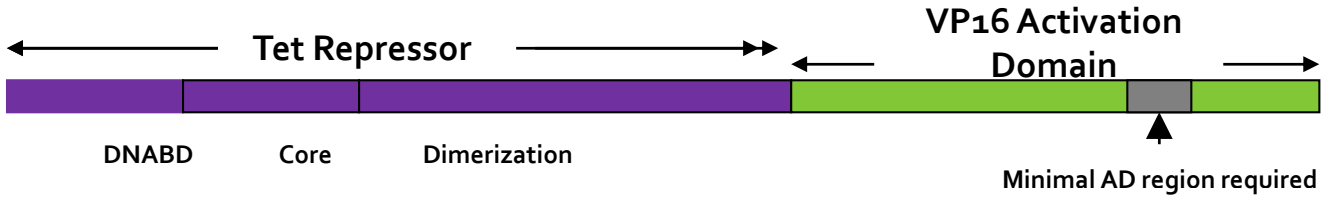
Response Vector carrying Gene of Interest downstream of a
Tet **R**esponse **E**lement (**TRE**) regulating **min**imal **CMV** promoter

The Tet System
Two-Vector System



Tet-On® Advanced v. Tet-On®

Tet-Off (tTA)



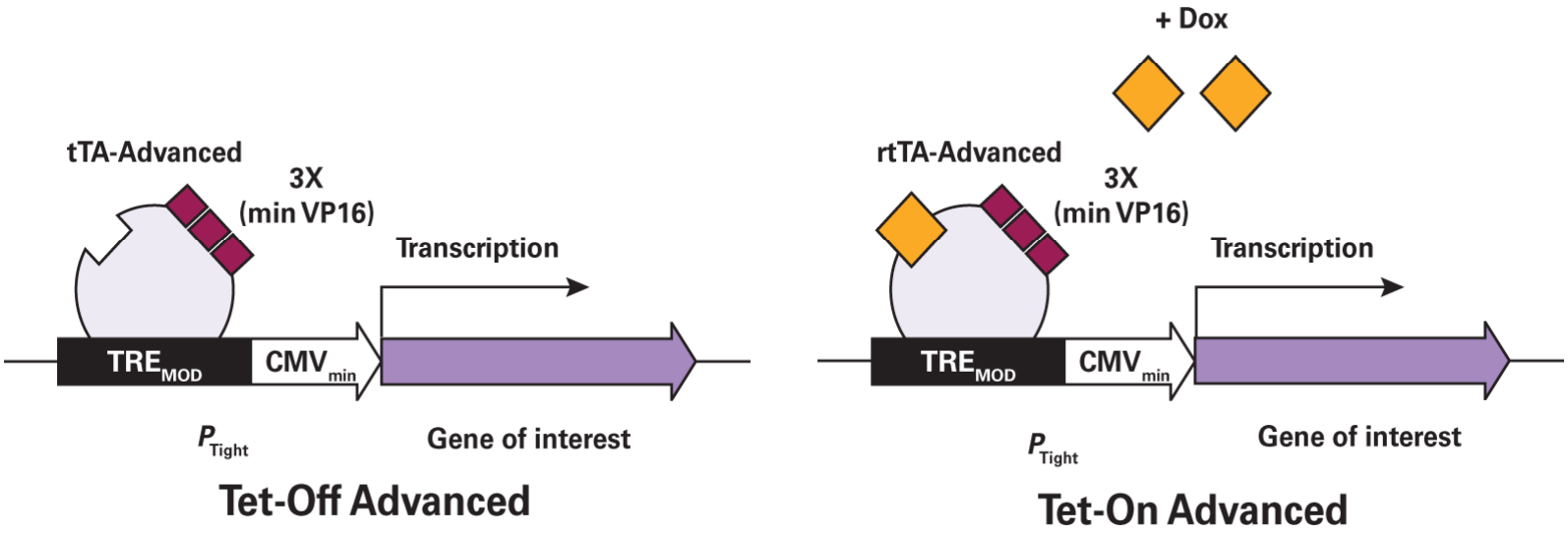
Tet-On (rtTA)

Tet-On Advanced (rtTAS2-M2)

- Minimal VP16 AD repeats: less toxicity (cell able to tolerate higher expression levels of rtTAS2-M2)
- Decreased residual binding to Tetracycline Response Element in the absence of DOX
- Tenfold higher sensitivity to Doxycycline: induction at lower concentration of Doxycycline
- Human Codon Optimized: higher expression levels of rtTA2S-M2, enhanced stability

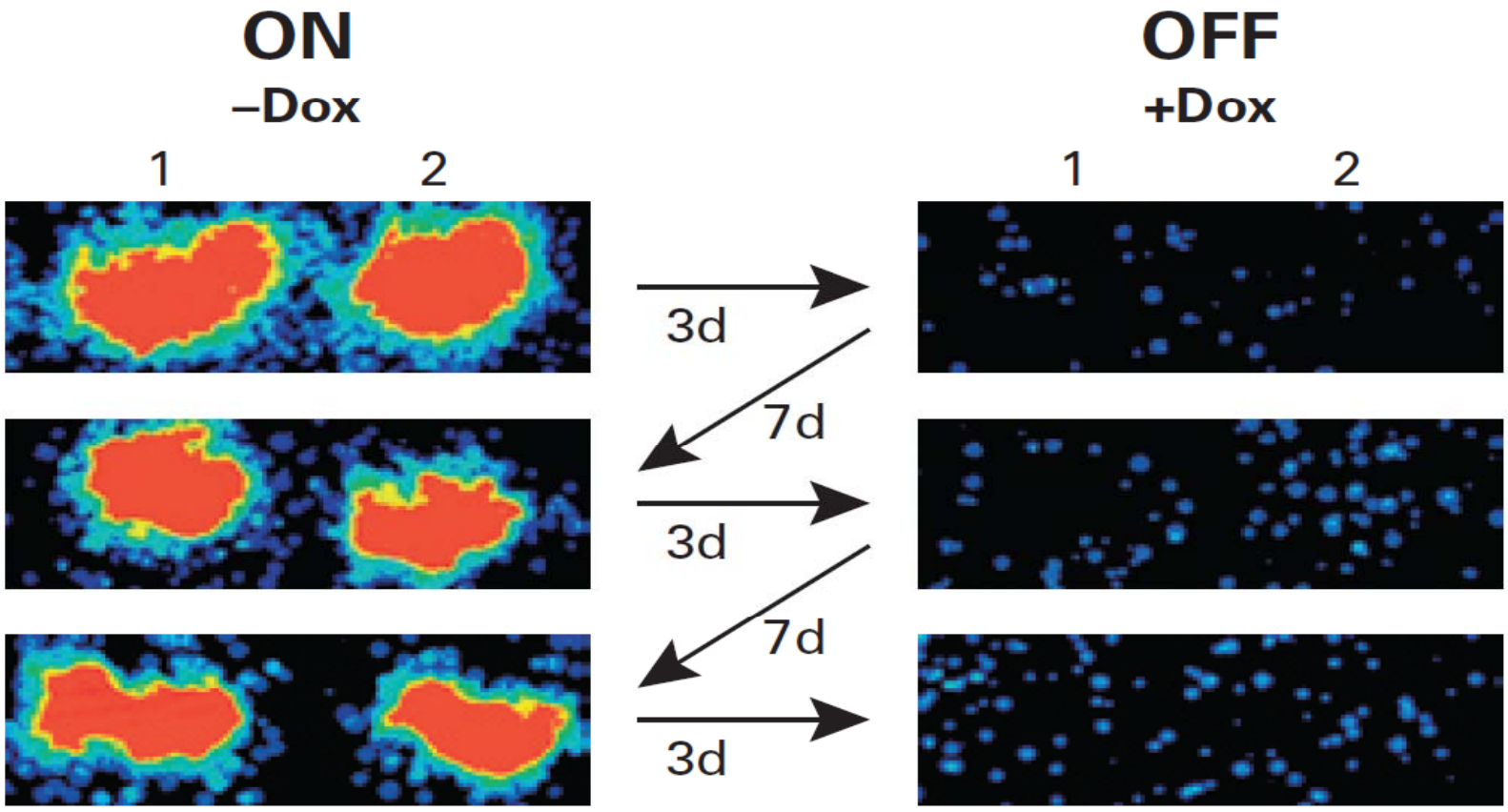
Tet-On® /Off® Advanced Inducible Expression Systems

Based on two elements: Regulatory and Response



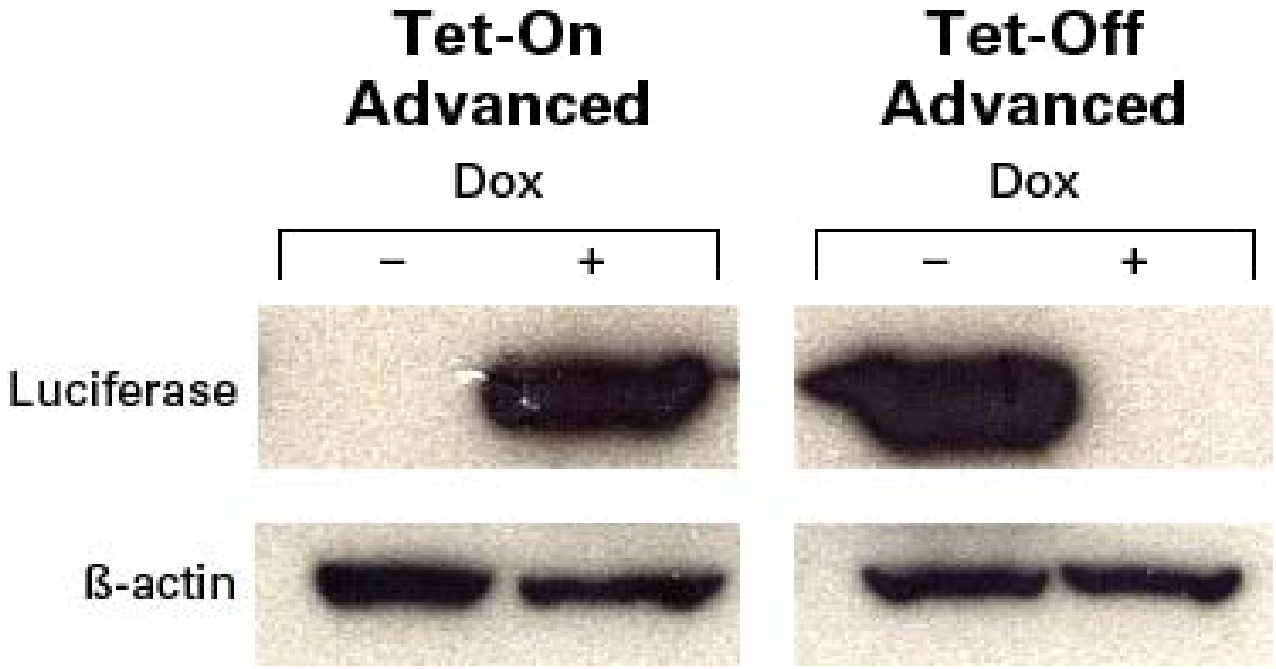
Promoter activation allows tunable regulation, high fold-induction

Gene activity controlled by supply or withdrawal of Dox



Tet- On® Advanced vs Tet –Off® Advanced

High inducible expression, undetectable basal expression

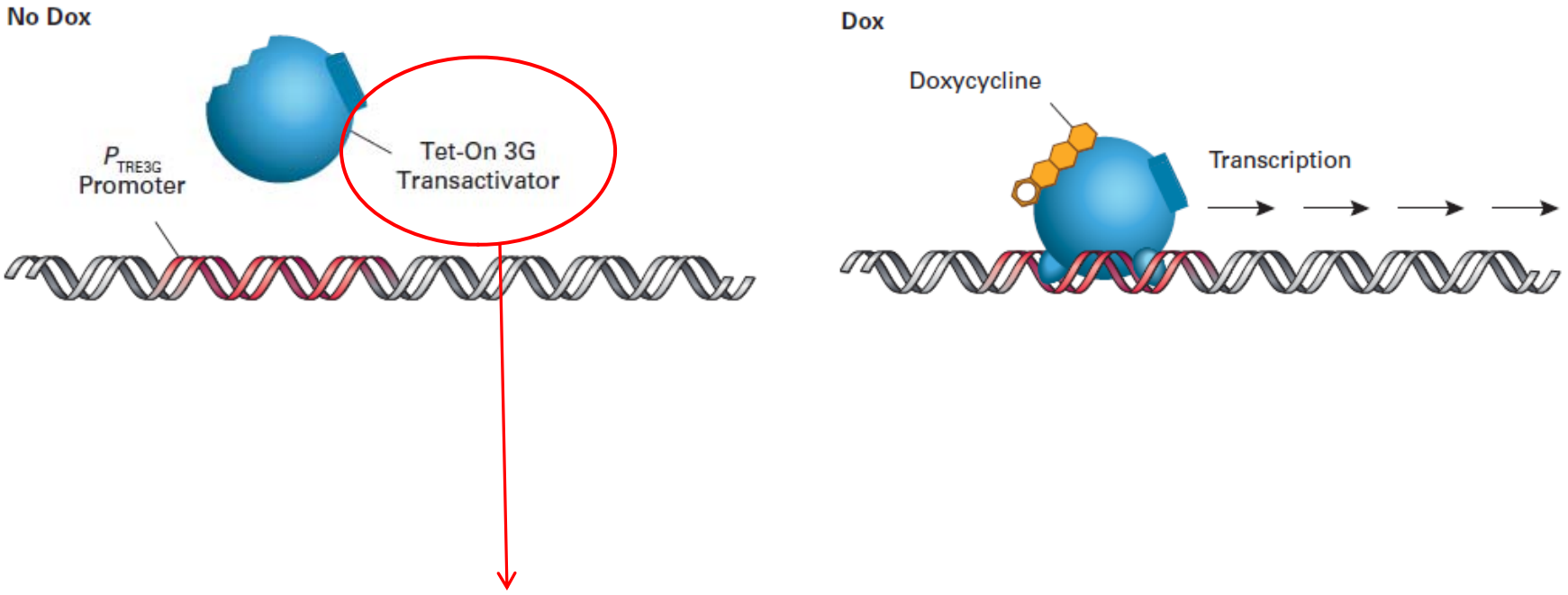


HEK 293 Tet-On Advanced
pTRE-Tight-Luc

HEK 293 Tet-Off Advanced
pTRE-Tight-Luc

Tet-On® Inducible Expression – The 3rd Generation

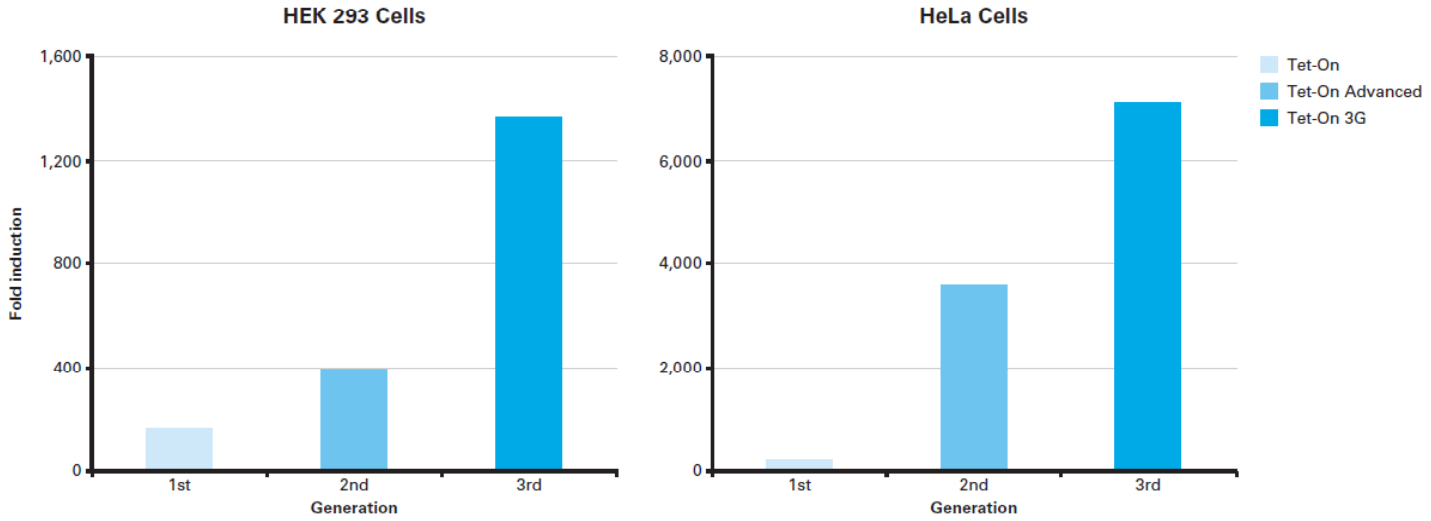
Tet-On® 3G Systems



New Tet-On Transactivator:
Increased sensitivity to Dox

Tet-On® 3G vs Tet-On®/Tet-On® Advanced

Three Generations of Tet-On Inducible Expression Systems			
Name	Generation	Transactivator Protein	Inducible Promoter
Tet-On System	1st	Tet-On	P_{TRE2}
Tet-On Advanced System	2nd	Tet-On Advanced	P_{TIGHT}
Tet-On 3G System	3rd	Tet-On 3G	P_{TRE3G}



The Tet Systems – Summary

- Inducible expression system for mammalian cells
- Transgene expression 조절
- Doxycycline(Dox:Tetracycline 유도체)
- Reversible reaction (가역적)
- Quantitative response (Dox 양에 따른 발현양 조절)
- Reproducibility (높은 재현성)