

## Plant Cell Suspension Cultures Problem: Need for reliable, safe, and scalable methods for PROTALIX production of biologics Biotherapeutics Approach: Plant cell suspension cultures Limitations: Advantages: Immune response to Inexpensive • Intrinsically biosafe plant glycans Complex products · Low growth rate and protein expression (post-translational Not well characterized modifications) or developed







Design Parameters and Assumptions: Upstream							
Production Target: 25 kg pure BChE year							
	Current (Laboratory Scale)	Projected (Manufacturing Scale)					
Initial culture density:	7	10	g FW/L				
Final culture density:	70	100	g FW/L				
Doubling time:	4	3	days				
Time, Initial to final density:	13	10	days				
Growth duration:	5	4	days				
Expression duration:	Expression duration: 5		days				
Total cycle time:	10	7	days				
Everyonian level	60	200	mg BChE/kg FW				
Expression level:	4	20	mg BChE/L culture				

Jesign Parameters and Assumptions: Downstream						
Overall Downstream BChE Recovery: 60%						
Step	Current (Lab Scale, Experimental*)		Projected (Manufacturing Scale)			
	Step Recovery	Process Recovery	Step Recovery	Process Recovery		
Crude Extract	100%	100%	100%	100%		
Clarification	100%	100%	96%	96%		
UF/DF (TFF)	95%	95%	97%	93%		
IEX (DEAE)	75%	71%	80%	73%		
Affinity (Hupresin)	60%	43%	85%	62%		
UF/DF (TFF)	95%	41%	95%	59%		









ECONOMICS: CAPEX, OPEX, COGS							
		0 11		Appual Operating Cos			
Parameter	Unit	Section	Base Case				
CAPEX \$ million		Upstream	141.6	Breakdown			
	\$ million	Downstream	24.4	Consumables			
		Total	166.0	Laboratory/QC/QA			
	\$	Upstream	2.6	6%			
OPEX	OPEX million/	Downstream	32.0				
year	Total	34.6	17%				
COGS <sup>\$/g</sup> BChE	Upstream	115	Bow Meteriola				
	Downstream	1,432	69%				
		Total	1,547				



