

Manufacturing at Genzyme's Allston Landing Facility

Future Allston Expansion

9/18/07: Genzyme Corp. (Nasdaq: GENZ) today broke ground on a significant expansion of its flagship manufacturing facility at Allston Landing in Boston. The \$150 million project is focused on adding space for manufacturing support functions and Cogeneration to support the energy demand of the plant including:

- Combustion turbine generator
- Heat recovery steam generator
- Boilers
- Emergency diesel generators



Products Filled and Finished at Allston

Cerezyme[®]
(imiglucerase for injection)



Myozyme[®]
(alglucosidase alfa)



Fabrazyme[®]
agalsidase beta

ALDURAZYME[®]
(LARONIDASE)

Replace the enzyme, help control the disease.

Thyrogen[®]
thyrotropin alfa for injection

genzyme

Lysosomal Storage Disorders

- 40 diseases classified as LSDs
- problem with a particular enzyme in the body
- relatively rare, grouped together they affect 1 in about every 7,700 babies born.
- Individually, however, each of the diseases is considerably more rare
 - 1 in 57,000 for the most common (Gaucher disease)
 - 1 in 4.2 million for the rarest (sialidosis).
- The most common LSDs among adults are Gaucher disease, Fabry disease, and Niemann-Pick disease (type A).

LSD therapies (Recombinant Forms of Lysosomal Enzymes)

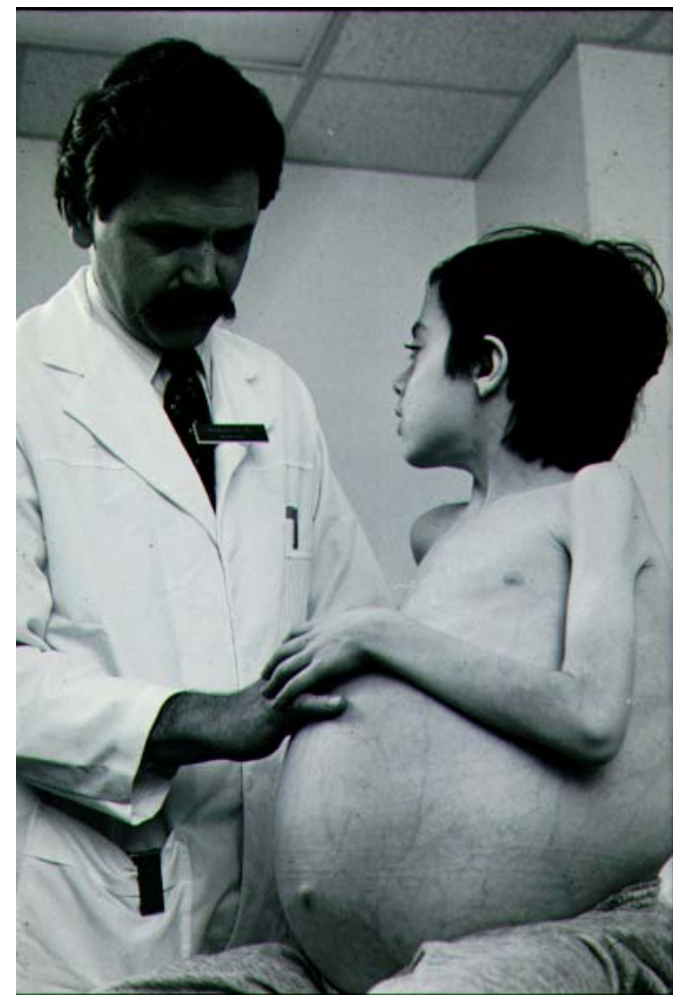


<u>Gaucher</u>	<u>Fabry</u>	<u>MPS1/Hurler Scheie</u>	<u>Pompe</u>
β -glucocerebrosidase	α -galactosidase	α -L-iduronidase	α -glucosidase
Glucocerebroside	Globotriaosylceramide (GL3)	Glycosaminoglycans (GAG)	Glycogen
Cerezyme®	Fabrazyme®	Aldurazyme®	Myozyme®



Gaucher Disease

- Gaucher disease causes fatty deposits to build up in certain organs and bones
- Wide variety of symptoms, affects less than 10,000 people worldwide.
- Gaucher cells accumulate in the liver, spleen, and bone marrow
- Bone-related symptoms can be particularly painful and debilitating, impairing a patient's mobility
- Children and adolescents may experience delay in growth and development.



Cerezyme®: Enzyme Replacement Therapy



- Prior to the introduction of enzyme replacement therapy (ERT), a major focus of Gaucher disease management was symptom relief.
- Treatments included various pain reduction therapies, blood transfusions, orthopedic surgery for bone and joint involvement, and possibly splenectomy.
- In 1991, Gaucher disease management shifted with the advent of targeted enzyme replacement therapy, developed by Genzyme Corporation in cooperation with the NIH. With the introduction of Cerezyme® (imiglucerase for injection) in 1994 and with its predecessor Ceredase ®, clinicians have been able to address the disease process itself, and therefore alleviate and even reverse many effects of Type 1 Gaucher disease
- Allston approved for Cerezyme® Manufacturing in 1996

Fabry's Disease



- **Affects more males than females**
 - 1 in 40,000 males has Fabry disease
 - Estimated prevalence in the general population is 1 in 117,000 people.
- **Cannot produce enough alpha-galactosidase A or alpha-GAL**
 - Alpha-GAL is needed to clear certain cells in the body of a fatty substance called globotriaosylceramide or GL-3.
- **Commonly affected cells are found in:**
 - blood vessels and tissues of the kidney, heart, skin, and brain
- **Buildup of GL-3 in these cells leads to life threatening problems.**



Pompe Disease

- Rare neuromuscular genetic disorder that occurs in babies, children, and adults
- Acid alpha-glucosidase (GAA) enzyme is either missing or in short supply, used to break down glycogen
- Progressive muscle weakness in both the infantile-onset and the late-onset forms of Pompe disease.
- Muscles most often affected are those used for breathing and mobility
- In infants, the heart muscle is often severely affected.

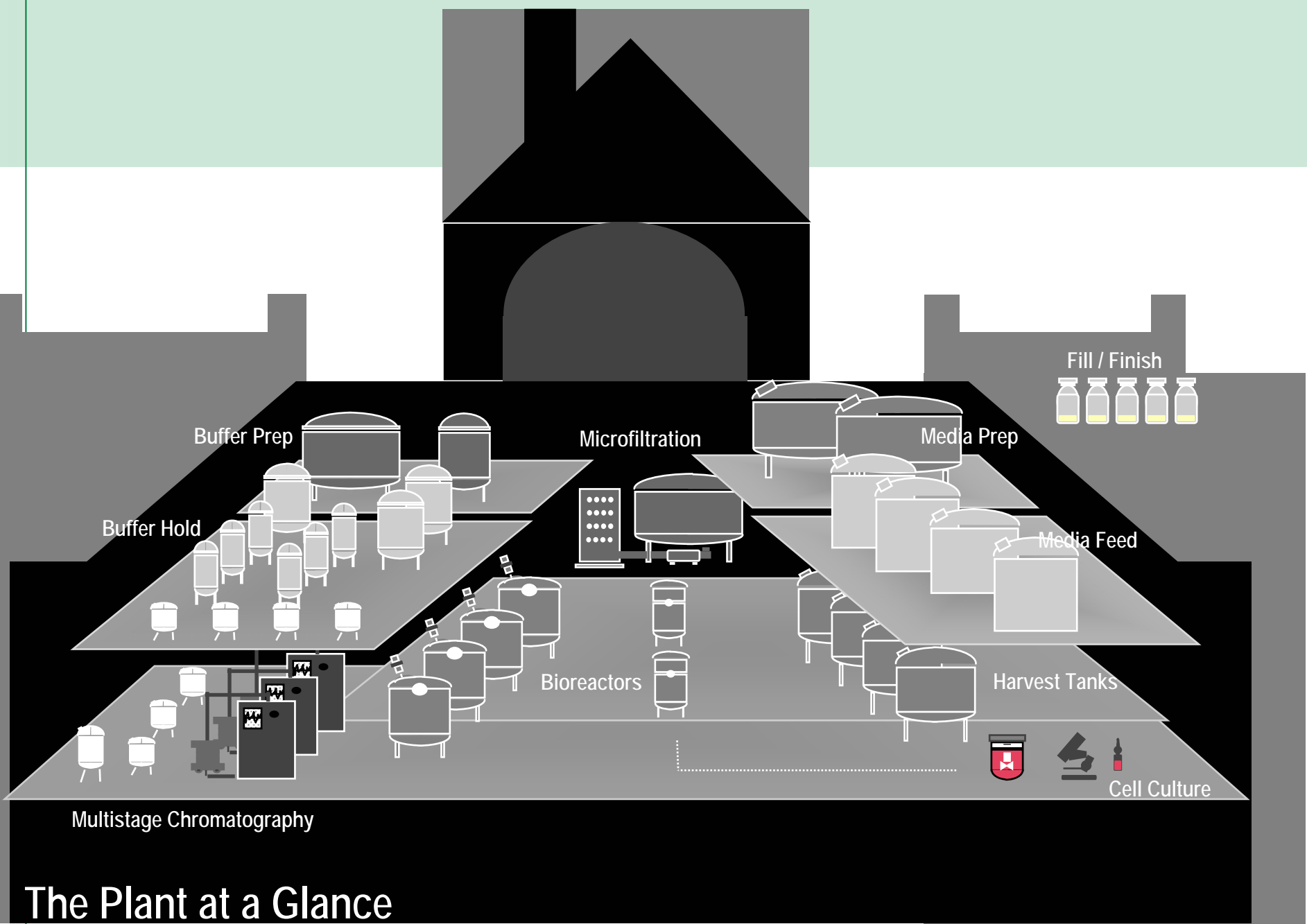
LSD Patient Population

Cerezyme®: >4,800 patients in ~90 countries

Fabrazyme®: >1,900 patients in ~45 countries

Myozyme®: >550 patients in ~35 countries

Aldurazyme®: >500 patients in ~40 countries



The Plant at a Glance

Media Preparation

Media

- 7 flavors of Media support 3 products
- Suite 1
 - 3 preparation trains, 500L, 5000L and 10,000L
- Suite 2
 - 2 preparation trains, 5,000L and 10,000L

Perfusion - Cell Culture

- Suite 1
 - 4 x 2500L Bioreactor trains including 5000L Media Feed and Harvest tanks
 - 2 x 250L Seed Bioreactor
 - Seed lab
- Suite 2
 - 2 x 2500 L Bioreactor trains including 5000L Media Feed and Harvest tanks
 - 1 250L Seed Bioreactor
 - Seed lab

Buffer Preparation

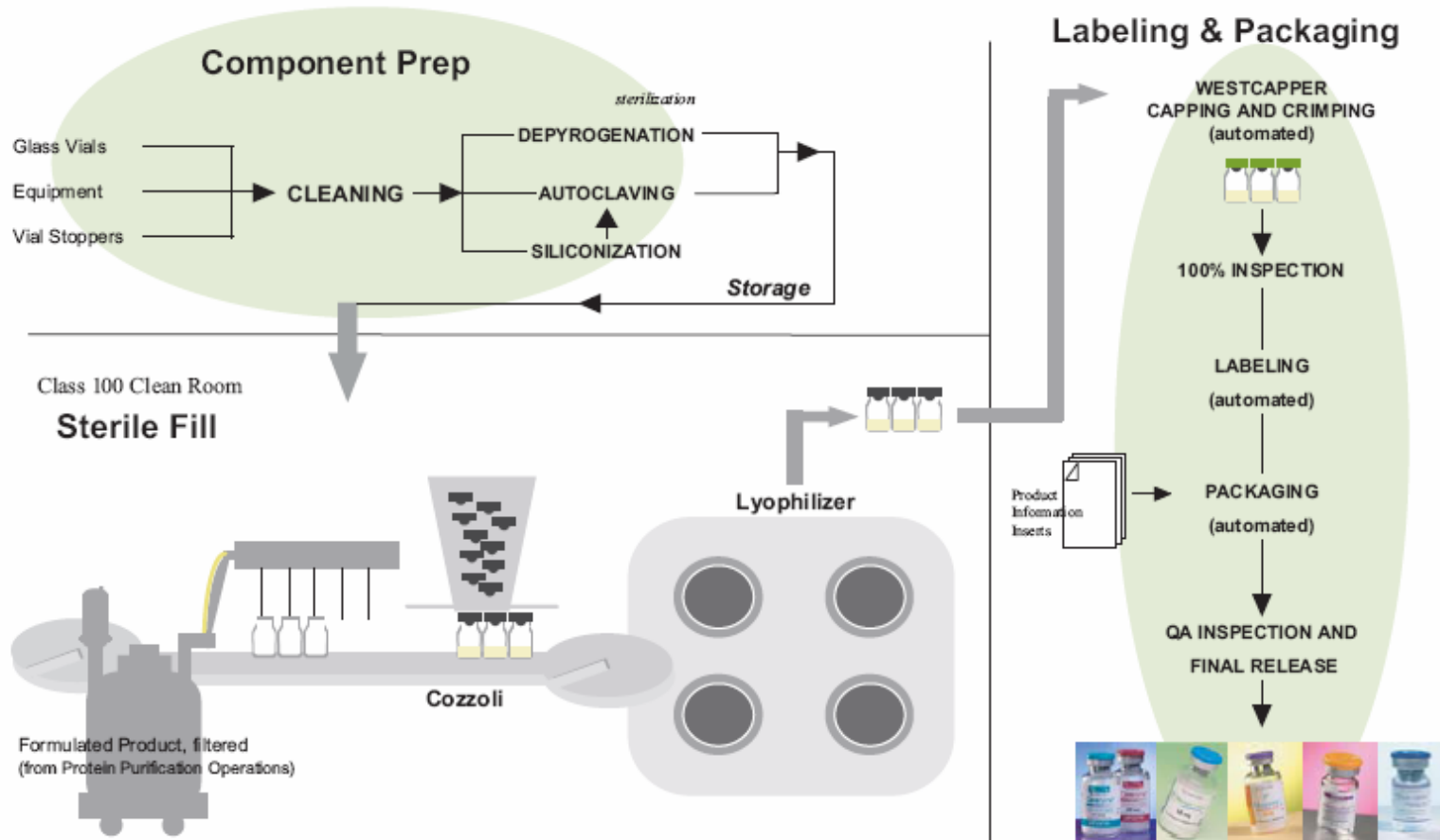
Buffer

- 60 flavors of buffer feeding 3 Purification trains for Myozyme®, Fabrazyme®, and Cerezyme®
- 6 Preparation trains ranging from 500L to 4000L all RS3 controlled
- Buffer hold capacity added for Suite 2 expansion, all DeltaV controlled

Purification

- Complete Purification for Cerezyme® and Myozyme®, Capture step for Fabrazyme® (remaining Purification in Framingham)
- Types of filtration/chromatography used
 - Microfiltration/Depth Filtration
 - Hydrophobic Interaction
 - Nanofiltration
 - Flow through
 - Cation Exchange
 - Anion Exchange
 - Ultrafiltration/Diafiltration
 - Metal Affinity

Fill/Finish



This is why...

To us, they are more than patients.
They are people.
They laugh and cry.
They hope and dream.
They have family and friends who love them.
They want to live normal lives.

This is why we do what we do.



Megan Assink – Pompe Disease