Industry leading
Cell Expression Platforms
Celonic has engineered CHOvolution™, a highly robust and outperforming mammalian cell line for the generation of high-level expression cell lines for biological entities and biosimilar products.

- **CHOvolution™ Cell Line Development Platform**
- **Royalty-free**
- **High productivity** (>7 g/L for mABs)
- **Customized workshops**
- **Cell lines in several Clinical Trials in EU, USA and Asia**
- **Cell lines based on CHO-K1 cells (non genetically modified CHO)**
- **Powered by Celonic’s proprietary SEFEX® technology**
High-Productivity

For large scale production of monoclonal antibodies & recombinant proteins, with high productivities (>7 g/l) in fed-batch culture processes.

• Cells are stable over 120 generation cycles and easily & predictably scaled-up up to 1,000L in single use bioreactors (SUB).

Viable cell density over time

Cell viability over time

Titers g/L

<table>
<thead>
<tr>
<th></th>
<th>CL</th>
<th>Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bispecific Antibody</td>
<td>0.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Fusion Protein</td>
<td>1.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Engineered mAB</td>
<td></td>
<td>5.4</td>
</tr>
<tr>
<td>mAB</td>
<td></td>
<td>2.2</td>
</tr>
</tbody>
</table>

• Productivities after development of clonal cell line (CL) and after process optimization (Dev).

High-Scalability in each Step

Viability and viable cell density almost identical from 250mL shake flask to 1,000L single use bioreactor.
GEX® is a screening and high yield production platform based on glycoengineered human cell lines for the development and production of biopharmaceuticals with a fully human and optimized glycosylation.

- Royalty-free
- Human cells for authentic-human glycosylation
- Perfusion
- Stable product quality over full-run time and different scales
- High productivity (up to 22g/L bioreactor volume for mAbs)
- Established expression platform for different biopharmaceuticals (e.g. mAbs, fusion proteins, bispecifics, enzymes, difficult-to-express or complex proteins)
- Regulatory approved by FDA, EMA, PEI etc
High-Productivity

Stable glycosylation patterns across various fermenter sizes result in products without differences in quality:
- Consistent quality over scale and time (0.05L – up to ~1,000L)
- Multiple runs and different facilities (R&D or GMP)
- Easy transferable processes (USP, DSP)

**MabExpress**: For optimized glycosylation for mAbs incl. bisGlcNAc, fucosylation, galactosylation, and sialylation

**FucoFlex**: For a flexible optimization of fucosylation degree

**SialoFlex**: For a flexible optimization of sialylation degree

**SialoMax**: For a maximal sialylation incl. α 2-3- and α 2-6-sialylation

**Broad Toolbox of GEX® Cell Lines**
Celonic offers standardized cell line development platforms, which can be adapted according to the specific needs of our customers.

**Advantages and Technology Benefits**

- **SIMPLIFIED LICENSING MODEL**
  (e.g. no royalties from sales)
- **Cell lines adapted to serum-free EMA and FDA COMPLIANT MEDIA**
- **HIGH SCALE-UP STABILITY**
- **GMP COMPLIANT**
  From R&D to market
- **Cell lines in several CLINICAL TRIALS in EU, USA and Asia**

**CHOvolution™**

- Powered by Celonic's proprietary SEFEX® technology
- Cell lines based on CHO-K1 cells (non genetically modified CHO)
- High productivity (up to 7 g/L for mABs)

**GEX®**

- Human cells for human glycosylation
- Optimized for complex and sophisticated biopharmaceutical product
- Stable product quality over entire run time for R&D and/or GMP
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