

BIONATURE



New Generation Native Form
Growth Factors

Advanced Protein Technology Inc. Offers Services and Recombinant Proteins:

Highly-active recombinant growth factors:

- Nature Form
- Non-tag
- High-Purity
- Stem Cell Growth Factors
- Cytokines
- Chemokines

Protein Refolding Services :

- Difficult-Protein
- Insoluble-Protein
- Cloudy-Protein
- Complex-Form Protein
- Custom-step Protein solution

Protein Expression Services:

- Difficult to express Protein
- Host-Optimization
- Mini-Preparations
- Induction-Optimization

Gene Cloning:

- Custom Insert
- Custom Vector
- DNA Optimization

Bulk Order Services:

- 1mg
- 10mg
- 50mg

Highly-active recombinant growth factors:

- Stem-Cell Growth Factors
- Cytokines
- Chemokines

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Current issues in commercial recombinant proteins.

Most commercially supplied proteins are expressed by bacteria or insect cells.

From then on protein of interest is purified with the help of affinity tags. These tags are extra residues on the expressed protein that can bind to affinity columns.



Protein structure is a function of protein sequence; therefore affinity tags may change protein 3D structure.

Affinity tags, inactive forms and incorrectly folded peptides compromises protein function:

1. There is change in residue sequence

2. Conformational change may occur due to changing stability

3. Contact surface arrangement may hinder function.

4. Proteins may not have the quaternary structure in the correct active form.



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Design

Advanced Protein Technology's proprietary chromatographic and protein refolding technology

Affinity-tag technology is outdated and potentially problematic, especially in fields such as stem cell research that have highly-demanding standards.

Tag-free

Bionature proteins are produced using APT's proprietary chromatographic technique designed to eliminate the need for affinity tags.

High refolding accuracy

Bionature proteins are refolded using APT's proprietary refolding technology designed to imitate native conditions for protein refolding to the correct conformations



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Reliability

Bionature growth factor gives consistent and reliable results.

Two main advantages are observed when utilizing APT's technologies.

1. Protein are correctly folded in the active form
2. Purity is extremely high, up to 98%

Bionature products are designed for highly demanding experiments such as stem-cell cultures where all unknown variables are minimized.

Figure 1 shows Bionature sample purity, figure 2 shows a Bionature sample bioactivity.

Figure 1: Bionature IL-2 Purity

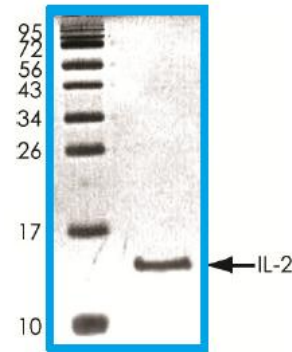
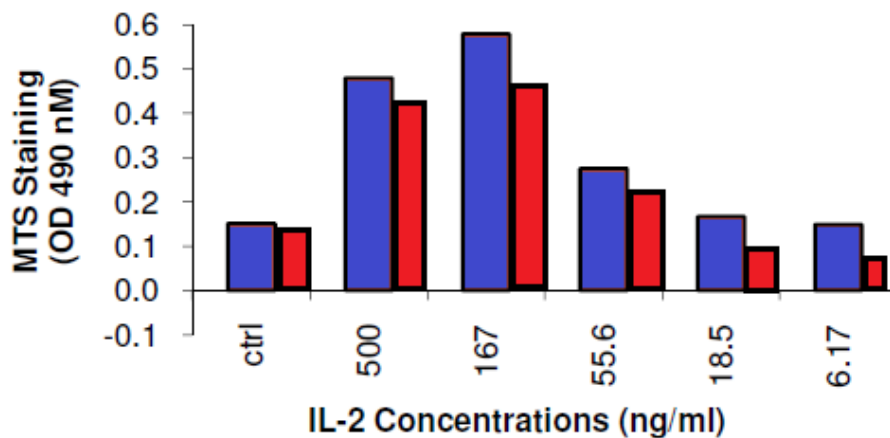


Figure shows SDS-PAGE densitometry analysis of Bionature IL-2

Figure 2: Bionature IL-2 Bioactivity Assay



Blue indicates Bionature IL-2 Activity levels. Red indicates our competitors IL-2 Activity levels.



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Figure 3: Product list

| Product Name | Gene Name | Brand Name | Purity | Protein Application | Species |
|---------------------------------|----------------------------|------------|--------|---------------------|---------|
| BMP 2 | BMP 2 | BioNature | >98% | Cell Culture | Human |
| BMP-4 | BMP-4 | BioNature | >98% | Cell Culture | Human |
| hGH | Growth Hormone | BioNature | >98% | Cell Culture | Human |
| IFN-r | IFNG | BioNature | >98% | Cell Culture | Human |
| IGF-1 | IGF-1 | BioNature | >98% | Cell Culture | Human |
| IL-18 | Interleukin-18 | BioNature | >98% | Cell Culture | Human |
| IL-2 | IL-2 | BioNature | >98% | Cell Culture | Human |
| IL-6 | IL6 | BioNature | >98% | Cell Culture | Human |
| IL-8 | IL-8 | BioNature | >98% | Cell Culture | Human |
| IP-10 | CXCL10 | BioNature | >98% | Cell Culture | Human |
| Leptin | Leptin | BioNature | >98% | Cell Culture | Human |
| mBMP-4 | Mouse BMP-4 | BioNature | >98% | Cell Culture | Mouse |
| Nanog | Nanog | BioNature | >98% | Cell Culture | Human |
| NTF3 | NTF3 | BioNature | >98% | Cell Culture | Human |
| Osteoprotegerin | TNFRSF11B | BioNature | >98% | Cell Culture | Human |
| PDGF full | PDGFA | BioNature | >98% | Cell Culture | Human |
| pDGf-aa | PDGFA | BioNature | >98% | Cell Culture | Human |
| pDGf-bb | PDGFB | BioNature | >98% | Cell Culture | Human |
| POU5 | POU5F1 | BioNature | >98% | Functional Assay | Human |
| RANTES | CCL5 | BioNature | >98% | Functional Assay | Human |
| sCD40L | CD40LG | BioNature | >98% | Functional Assay | Human |
| sCGF-a | CLEC11A | BioNature | >98% | Functional Assay | Human |
| SDF-1 | SDF-1 | BioNature | >98% | Functional Assay | Human |
| TGF-b2 | TGFB2 | BioNature | >98% | Functional Assay | Human |
| TGF-b3 | FLJ16571; TGF-beta3 | BioNature | >98% | Functional Assay | Human |
| TNF-a | TNF-alpha; TNFA; TNFSF2 | BioNature | >98% | Functional Assay | Human |
| TNF-b | TNF-b | BioNature | >98% | Functional Assay | Human |
| Trail | Trail | BioNature | >98% | Functional Assay | Human |
| VEGF-c | VEGF-c | BioNature | >98% | Functional Assay | Human |