

SUDx-Biotec Corp.

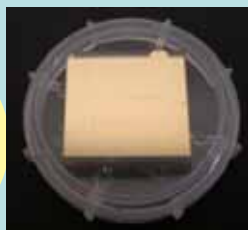
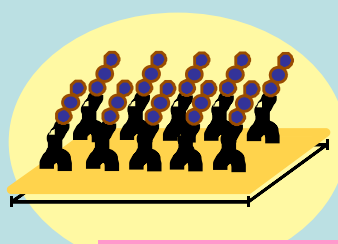
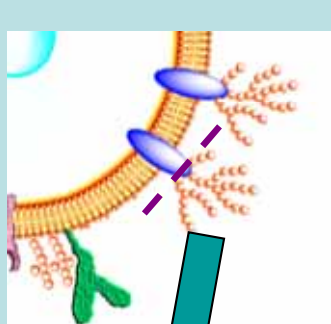
[http:// www.sudxbiotec.jp/](http://www.sudxbiotec.jp/)



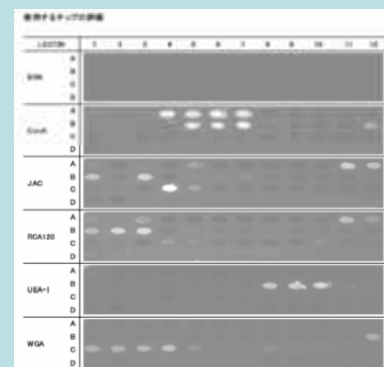
SUDx-Biotec was established as a Kagoshima Univ. derived venture company in 2006 based on results of the "Practical Use of the Sugar Chip" pre-venture program sponsored by the Japan Science and Technology Agency (JST). The following explains our technology and tools to support the study of "Sugar-Chains".

Basic Technology : Immobilization of Sugar-Chains on gold surface

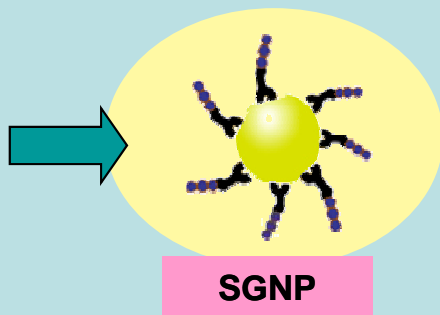
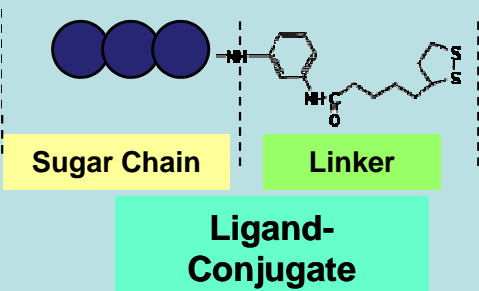
- > Sensor Chip of Surface Plasmon Resonance (SPR) designated as "Sugar-Chip"
- > Sugar-Chain immobilized Gold Nano Particle (SGNP)



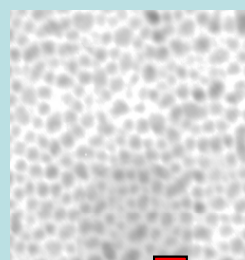
Sugar Chip (SC)



High-throughput Analysis



SGNP



10 nm



Visual Detection
Selective Concentration

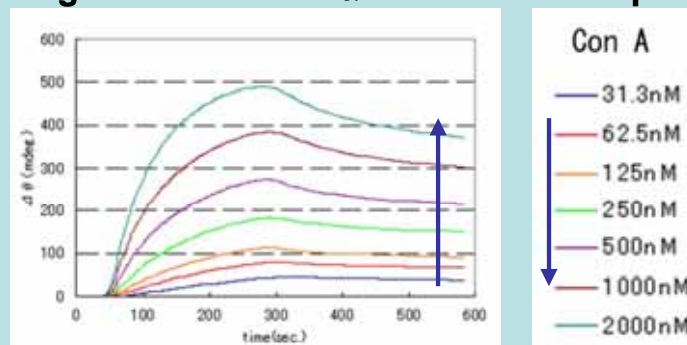
Advantages

- > Analysis is available without labeling of targets
- > Applicable for unknown target (protein, virus, bacteria) >> novel diagnosis technology

Analytical System using Sugar Chip

- Sugar Chip is a sensor chip for SPR **immobilized with Sugar-Chain** on gold-coated glass plate
- **Three types** of Sugar Chip
 - #1: One ligand (Sugar Chain) for 2 analytes
 - #2: One ligand for 12 samples
 - #3: Maximum 96 ligands for one analyte (Array type Sugar Chip)
- By SPR (Surface Plasmon Resonance), **high-throughput analysis** of the interactions with Sugar-Chains and analytes (proteins, viruses, bacteria) can be performed **on time without labeling of targets.**

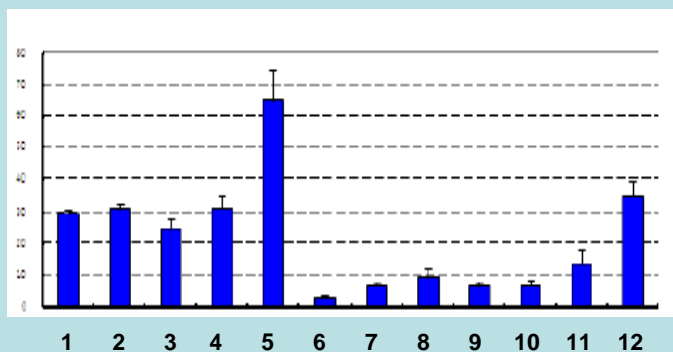
Binding of Con A to Glc α 1-4Glc-mono chip



Quantification: Kinetic parameters

	K_D (nM)	k_a ($M^{-1} \cdot sec^{-1}$)	k_d (sec^{-1})
Glc α 1-4Glc-mono	480	1.1×10^3	5.2×10^{-3}
Man α 1-2Man-mono	1200	3.9×10^3	4.6×10^{-3}
Man α 1-6Man-mono	670	10×10^3	6.9×10^{-3}

Example using Array-type Sugar Chip: Screening of Sulfated Sugar Chains to which Lenti-viral vector binds

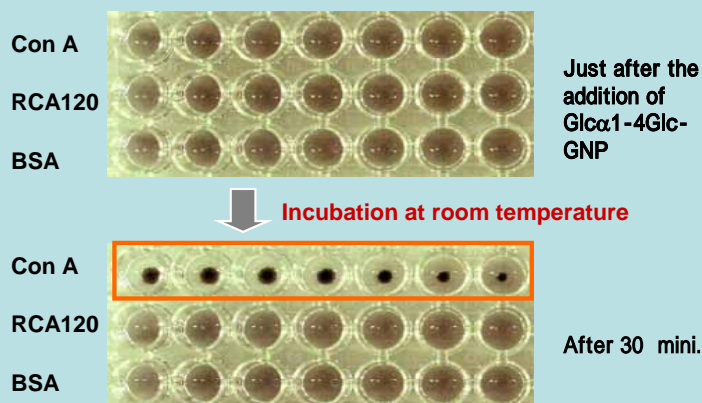


- 1) GlcNS6S α 1-4Glc β 1-6Glc
- 2) GlcNS6S α 1-4IdoA α 1-6Glc
- 3) GlcNS α 1-4Glc β 1-6Glc
- 4) GlcNS α 1-4IdoA α 1-6Glc
- 5) Heparin
- 6) Chondroitin
- 7) Chondroitin sulfate A
- 8) Chondroitin sulfate B
- 9) Chondroitin sulfate C
- 10) Chondroitin sulfate D
- 11) Chondroitin sulfate E
- 12) Glc β 1-3GalNAc4S6S β 1-6Glc

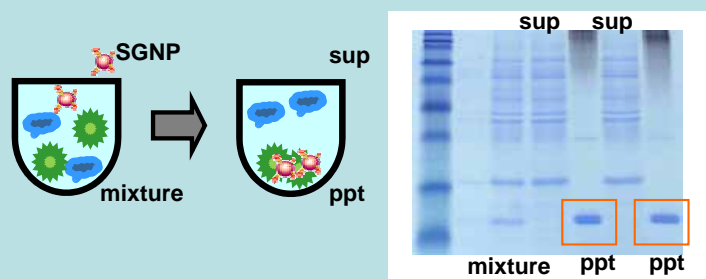
Sugar-chain immobilized Gold Nano Particle (SGNP)

- Sugar-Chains are immobilized on gold nanoparticles of size 5 ~ 20 nm (controllable).
- When SGNP interacts with multi-valent protein (like lectin), SGNP turns to aggregate, making possible for visual detection without additional apparatus.
- Applicable for the basic research of carbohydrate, such as **one-step purification of Sugar-chain binding protein or probe for dot-blotting**
- SGNP immobilized with receptor sugar chain for virus concentrated very low dose of virus in the clinical sample. **By the combination of SGNP and PCR, a high-sensitivity diagnostic system for virus was developed.** Recently, the system was successively used for the detection of unapparent infected patients of influenza.

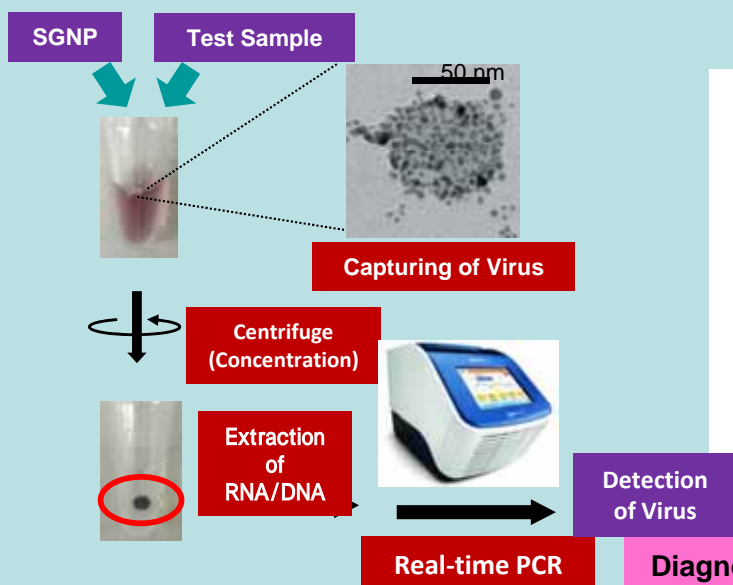
Visual Detection of the Interaction



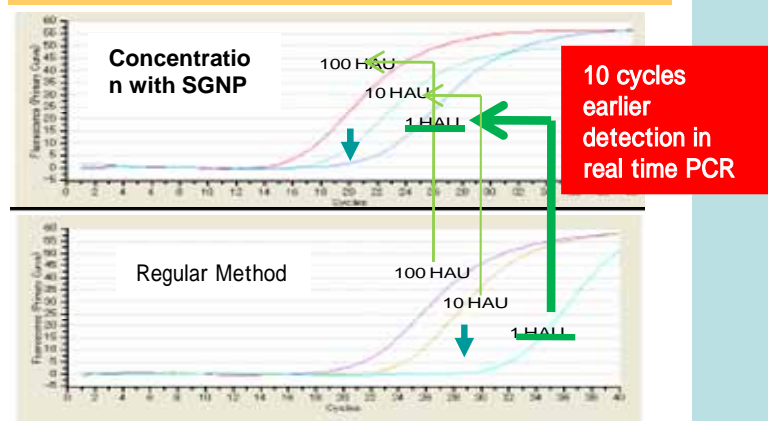
One-step purification of lectin



High Sensitive Diagnostic System of Viruses using SGNP and Quantitative Real-time PCR



Type A Influenza virus (A/Wyoming/2003/7)



Diagnosis is possible of virus cDNA at very low concentration, which is under the detection limit of the regular method!!

