**Supplementary Figure 1:** ROC curves for ELLA-SNAs and ELLA-AALs and the combination assays.

Panel A shows the ROC curves of the ELLA-SNAs, ELLA-AALs and the combination assay for discriminating women with CIN 2+ from normal. Panel B shows the ROC curves for discriminating women with CIN 3+ from normal and Panel C shows the ROC curves for discriminating women with cervical cancer from normal.



**Supplementary Figure 2:** Comparison of reactivities of ECCs from normal and cancer group against four different types of lectins detecting fucosylations in ELLAs.

ELLAs were carried out as described in Materials and methods. AAL (A) recognizes all types of fucosylations. *Aspergillus oryzae l-fucose-specific*lectin (AOL; TCI, JAPAN) (B), *Ulex europaeus*I (UEA I; Vector lab, USA) (C) and *Lens culinaris* (LCA; Vector lab, USA) (D) recognize α 1.6-linked fucosylation, α 1.2-linked fucosylation and core-fucosylation with bi-antennary N-glycans, respectively. The central line represents the median, and the top and bottom, the 75th and 25th percentiles, respectively. Normal, n=10; Cancer, n=10. The largest difference between normal and cancer group was found in ELLA-AOL, indicating that the reductions in α 1,6-linked fucosylation levels are responsible for the reduced fucosylation levels of cancer group.



**Supplementary Figure 3:** Banding patterns of ECC lysates proteins from normal and cancer following SDS-PAGE and lectin blots for detecting different types of fucosylations.

Four microgram per well of cell lysate protein was loaded on 12.5% polyacrylamide gel for silver stained gel (A) and one microgram per well for lectin blots of AAL (B), AOL (C), UEA I (D) and LCA (E). The PVDF membranes were blocked with 3% oBSA in TBST for 4 h and reacted with 1 μg/mL of biotinylated AAL, AOL, UEA I or LCA for 1 h at RT to detect α 1.2/1.3/1.6-linked fucosylation, α 1.6-linked fucosylation, α 1.2-linked fucosylation and core-fucosylation with bi-antennary N-glycans, respectively. The membranes were then incubated with HRP-conjugated streptavidin (1:10,000 dilution ratio) and developed as described in Materials and methods. Normal, n=5; Cancer, n=5.



**Supplementary Figure 4:** Flow cytometry analysis of sialylation levels of ECCs in normal and cancer group.

(A) Shows representative plots of control that were not stained with SNA. (B) Are representative plots of normal and cancer group. The cervical cells were stained with biotinylated SNA, together with FITC-conjugated streptavidin (PIERECE, USA). (C) Shows proportions of SNA+ cells (H-1) of normal and cancer group. Normal, n=10; Cancer, n=10.



**Supplementary Figure 5:** Flow cytometry analysis of ECC populations possessing sialylation in normal and cancer group.

A and B are representative plots of cervical cells from normal and cancer group, respectively. Red spots indicate SNA+ cell population. Other details are same as for Supplementary Figure 4.

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