Supplementary Information for

Fast Label-Free Recognition of NRBCs by Deep-Learning Visual Object Detection and Single-Cell Raman Spectroscopy

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Table S1. The assignments of Raman bands in hb+ spectra.

| Raman band (cm^{-1})		Assignment
Previous works	Present work	
677[1]	677	δ (pyr deform)$_{sym}$
754[2]	754	ν (pyr breathing)
974[1]	975	γ (C$_a$H=)
992[1]	991	ν (C$_\beta$C$_1$)$_{asym}$
1072[1]	1072	δ (=C$_b$H$_2$)$_4$
1127[1]	1125	ν (C$_\beta$–methyl)
1170[1]	1170	ν (pyr half-ring) $_{asym}$
1215[2]	1215	δ (C$_m$H)
1301[3], 1305[1]	1299	δ (C$_m$H)
1336[2]	1338	ν (pyr quarter ring)$_{sym}$
1356[1], 1358[2]	1354	ν (pyr half ring)$_{sym}$
1384[1]	1385	ν (pyr half ring)$_{sym}$
1423[3]	1419	ν (C$_\alpha$C$_m$) $_{sym}$
1448[1]	1450	δ(CH$_2$/CH$_3$)
1547[1]	1545	ν (C$_\beta$C$_\beta$)
1582[1]	1579	ν (C$_\alpha$C$_m$) $_{asym}$
1604[2]	1601	ν(C$_a$=C$_b$)
Abbreviations: pyr, pyrrole rings		
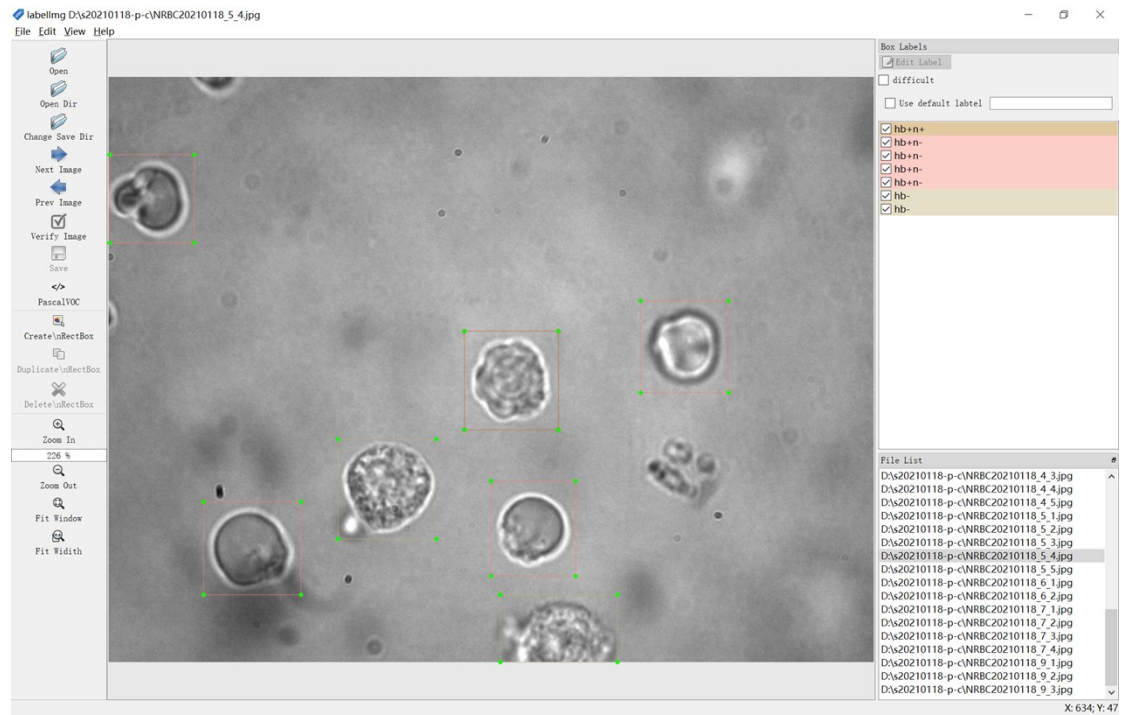
Figure S1. An example of dataset made by *LableImg*. The cells in an image would be annotated by rectangular bounding boxes with corresponding class names. The final annotation file would be generated as Pascal VOC format to describe the image.
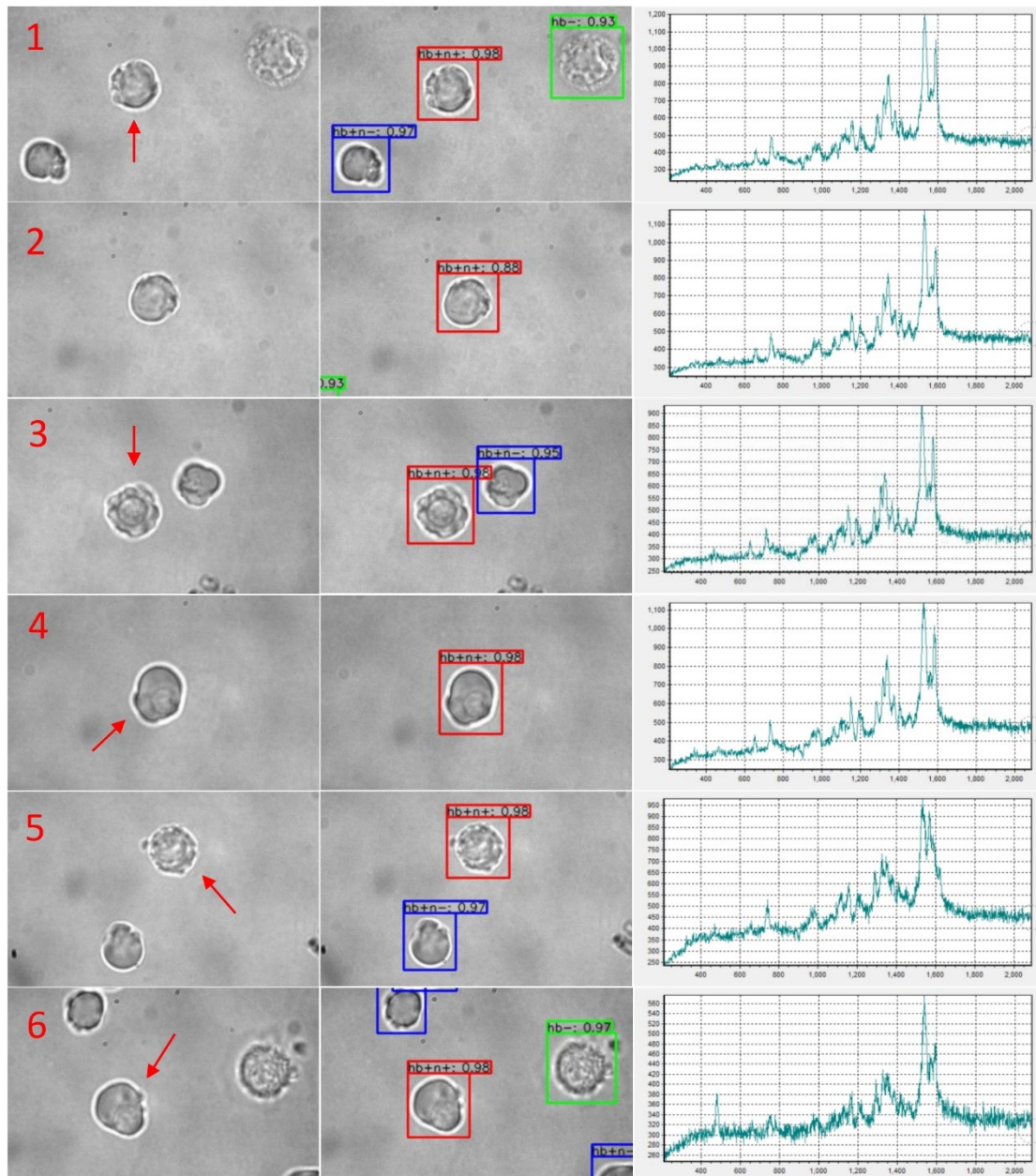
Figure S2. The six NRBCs found in maternal peripheral blood: raw microscopic images (left column), real-time detection results by YOLOv3 (middle column, the color system of cell annotation is the same as in Figure 3), and corresponding Raman spectra that did contain hemoglobin signals (right column).

References

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