

Ex vivo peripheral nerve detection of rats by spontaneous Raman spectroscopy

Takeo Minamikawa^{a,*}, Yoshinori Harada^a, and Tetsuro Takamatsu^b

^aDepartment of Pathology and Cell Regulation, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, 465 Kajii-cho Kawaramachi-Hirokoji, Kamigyo-ku, Kyoto, 602-8566, Japan

^bDepartment of Medical Photonics, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, 465 Kajii-cho Kawaramachi-Hirokoji, Kamigyo-ku, Kyoto, 602-8566, Japan

*E-mail: tminami@koto.kpu-m.ac.jp

Supplementary Table S1 Prediction results for tissue species with dimensional reduction of PCs. The right column PN (MN+UMN) indicates the sensitivities and specificities in which the peripheral nerves including myelinated nerve and unmyelinated nerve were predicted to be at least either myelinated nerve or unmyelinated nerve. MN, myelinated nerve; UMN, unmyelinated nerve; A, adipose tissue; C, collagenous tissue; SM, skeletal muscle; PN, peripheral nerve; PPV, positive predictive value; and NPV, negative predictive value.

| Prediction | Dimensional reduction of PC1 | | | | | PN (MN+UMN) |
|-----------------|------------------------------|------|------|------|------|----------------|
| | MN | UMN | A | C | SM | |
| MN | 957 | 19 | 1 | 2 | 4 | 1855 |
| UMN | 25 | 854 | 37 | 109 | 88 | |
| A | 0 | 0 | 962 | 0 | 0 | 0 |
| C | 15 | 59 | 0 | 881 | 14 | 74 |
| SM | 3 | 68 | 0 | 8 | 894 | 71 |
| Sensitivity (%) | 95.7 | 85.4 | 96.2 | 88.1 | 89.4 | 92.8 |
| Specificity (%) | 99.4 | 93.5 | 100 | 97.8 | 98.0 | 92.0 |
| PPV (%) | 97.4 | 76.7 | 100 | 90.9 | 91.9 | 88.5 |
| NPV (%) | 98.9 | 96.2 | 99.1 | 97.0 | 97.4 | 95.0 |

Dimensional reduction of PC2

| Prediction | Histology | | | | | PN (MN+UMN) |
|-----------------|-----------|------|------|------|------|----------------|
| | MN | UMN | A | C | SM | |
| MN | 956 | 16 | 6 | 2 | 8 | 1818 |
| UMN | 26 | 820 | 148 | 78 | 95 | |
| A | 0 | 3 | 825 | 28 | 43 | |
| C | 15 | 108 | 21 | 881 | 9 | |
| SM | 3 | 53 | 0 | 11 | 845 | |
| Sensitivity (%) | 95.6 | 82.0 | 82.5 | 88.1 | 84.5 | 90.9 |
| Specificity (%) | 99.2 | 91.3 | 98.2 | 96.2 | 98.3 | 88.8 |
| PPV (%) | 96.8 | 70.3 | 91.8 | 85.2 | 92.7 | 84.4 |
| NPV (%) | 98.9 | 95.3 | 95.7 | 97.0 | 96.2 | 93.6 |

Dimensional reduction of PC3

| Prediction | Histology | | | | | PN (MN+UMN) |
|-----------------|-----------|------|------|------|------|----------------|
| | MN | UMN | A | C | SM | |
| MN | 884 | 17 | 1 | 0 | 105 | 1730 |
| UMN | 67 | 762 | 15 | 101 | 255 | |
| A | 0 | 0 | 978 | 0 | 0 | |
| C | 6 | 35 | 0 | 882 | 173 | |
| SM | 43 | 186 | 6 | 17 | 467 | |
| Sensitivity (%) | 88.4 | 76.2 | 97.8 | 88.2 | 46.7 | 86.5 |
| Specificity (%) | 96.9 | 89.1 | 100 | 94.7 | 93.7 | 84.1 |
| PPV (%) | 87.8 | 63.5 | 100 | 80.5 | 65.0 | 78.4 |
| NPV (%) | 97.1 | 93.7 | 99.5 | 97.0 | 87.5 | 90.3 |

Dimensional reduction of PC4

| Prediction | Histology | | | | | PN (MN+UMN) |
|-----------------|-----------|------|------|------|------|----------------|
| | MN | UMN | A | C | SM | |
| MN | 844 | 146 | 10 | 0 | 13 | 1875 |
| UMN | 156 | 729 | 20 | 98 | 98 | |
| A | 0 | 0 | 970 | 0 | 0 | 0 |
| C | 0 | 69 | 0 | 902 | 16 | 69 |
| SM | 0 | 56 | 0 | 0 | 873 | 56 |
| Sensitivity (%) | 84.4 | 72.9 | 97.0 | 90.2 | 87.3 | 93.8 |
| Specificity (%) | 95.8 | 90.7 | 100 | 97.9 | 98.6 | 92.0 |
| PPV (%) | 83.3 | 66.2 | 100 | 91.4 | 94.0 | 88.7 |
| NPV (%) | 96.1 | 93.0 | 99.3 | 97.6 | 96.9 | 95.7 |

Dimensional reduction of PC5

| Prediction | Histology | | | | | PN (MN+UMN) |
|-----------------|-----------|------|-------|------|------|----------------|
| | MN | UMN | A | C | SM | |
| M | 957 | 23 | 19 | 0 | 2 | 1644 |
| UM | 42 | 622 | 5 | 86 | 68 | |
| AD | 0 | 0 | 964 | 0 | 0 | 0 |
| CT | 0 | 298 | 0 | 823 | 45 | 298 |
| SM | 1 | 57 | 12 | 91 | 885 | 58 |
| Sensitivity (%) | 95.7 | 62.2 | 96.4 | 82.3 | 88.5 | 82.2 |
| Specificity (%) | 98.9 | 95.0 | 100 | 91.4 | 96.0 | 94.0 |
| PPV (%) | 95.6 | 75.6 | 100.0 | 70.6 | 84.6 | 90.1 |
| NPV (%) | 98.9 | 91.0 | 99.1 | 95.4 | 97.1 | 88.8 |