

Table SI. Information about the procedures and optimized analytical variables for each antibody used in the study and *histoscore* evaluation

| Antigen | Staining pattern | Staining evaluation | Clone | Pretreatment; detection platform ^a | Dilution | Source |
|------------------------|--|----------------------------|------------|---|----------|---------------------------------|
| Ki67 ^b | Nuclear | Nuclear | MIB-1 | PT Link Low 95°C 20 min; EnvisionFlex | RTU | Dako (Glostrup, Denmark) |
| Cyclin D1 ^b | Nuclear and cytoplasmic | Nuclear | EP12 | PT Link High 95°C 20 min; EnvisionFlex | RTU | Dako (Glostrup, Denmark) |
| p16 | Nuclear and cytoplasmic | Nuclear and cytoplasmic | E6H4 | PT Link Low 95°C 20 min; EnvisionFlex | RTU | Ventana (Tucson, USA) |
| p53 | Nuclear | Nuclear | DO-7 | PT Link High 95°C 20 min; EnvisionFlex | RTU | Dako (Glostrup, Denmark) |
| pRB | Nuclear | Nuclear | 1F8 | PT Link High 95°C 20 min; EnvisionFlex | 1:100 | Abcam (Cambridge, UK) |
| hTERT | Nuclear and cytoplasmic | Nuclear and cytoplasmic | 2C4 | PT Link Low 95°C 20 min; EnvisionFlex | 1:200 | Abcam (Cambridge, UK) |
| PTEN | Nuclear and cytoplasmic | Cytoplasmic | 6H2.1 | PT Link High 95°C 20 min; EnvisionFlex | 1:100 | Dako (Glostrup, Denmark) |
| BRAF/V600E | Cytoplasmic | Cytoplasmic | VE1 | Ventana conditions | RTU | Ventana (Tucson, USA) |
| Cav 3.1 | Membranous and cytoplasmic | Membranous and cytoplasmic | Polyclonal | PT Link Low 95°C 20 min; EnvisionFlex | 1:150 | Antibody BCN (Barcelona, Spain) |
| Cav 3.2 | Membranous, cytoplasmic and nuclear occasionally | Membranous and cytoplasmic | Polyclonal | PT Link High 95°C 20 min; EnvisionFlex | 1: 200 | Antibody BCN (Barcelona, Spain) |

^aEpitope retrieval in the PreTreatment Module, PT-LINK (Dako, Glostrup, Denmark). EnVision FLEX Detection Kit (Dako) using diaminobenzidine chromogen as the substrate. BRAF V600E detection was performed using the Ventana platform (Tucson, AZ, USA). ^bProliferation and cell-cycle markers (Ki67 and cyclin D1) were not evaluated in lentiginous junctional naevi, without clear naevi nest, due to the difficulty of discerning between proliferating naevus cells and proliferating keratinocytes of the epidermal basal layer.

Immunohistochemistry staining was graded semiquantitatively by considering the percentage and intensity of the staining. A histological score (*Hsc*) was obtained from each sample and values ranged from 0 (no immunoreactivity) to 300 (maximum immunoreactivity). The score was obtained by applying the following formula, $Hsc = [1 \times (\% \text{ light staining})] + [2 \times (\% \text{ moderate staining})] + [3 \times (\% \text{ strong staining})]$.

PTEN: phosphatase and tensin homologue; RTU: ready to use. hTERT: telomerase; cycl D1: cyclin D1.