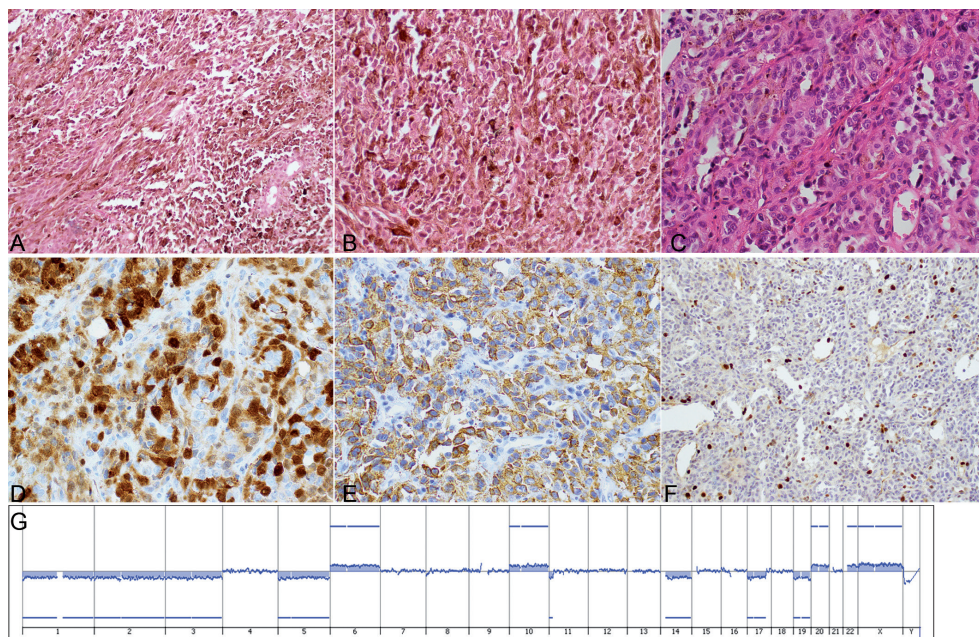


Fig. S1. Histological illustration of a malignant melanoma on congenital melanocytic naevus with fluorescence *in situ* hybridization (FISH) and comparative genomic hybridization (CGH) data (patient 1). (A) Malignant partially necrotic nodule located in the dermis and the subcutis under the naevus (HES  $\times 25$ ). (B) Dermal nodule with large epithelioid cells and necrosis (HES  $\times 200$ ). (C) Immunohistochemistry with P16 showing a clear cytoplasmic expression ( $\times 400$ ). (D) Immunohistochemistry with HMB45 showing diffuse cytoplasmic expression ( $\times 200$ ). (E) Immunohistochemistry with Mib1 showing a low proliferative index ( $\times 200$ ). (F) FISH study (VysisLSI CCND1-green, 11q13) showing polysomy. (G) CGH profile showing a complex profile similar to sporadic melanoma.



*Fig. S2.* Morphological illustration of a malignant melanoma on congenital melanocytic naevus with CGH data (patient 3). (A and B) Early histological presentation of the melanoma presenting with spindle-shaped pigmented cells without any atypia similar to blue naevus (HES  $\times 100$ ). (C) Some years later, atypical features with large epithelioid non-pigmented cells, cytological atypia and mitoses ( $\times 200$ ). (D) Immunohistochemistry with P16 showing strong both cytoplasmic and nuclear expression ( $\times 200$ ). (E) Immunohistochemistry with HMB45 showing diffuse cytoplasmic positivity ( $\times 200$ ). (F) Ki67 evaluation showing a low proliferative index ( $\times 100$ ). (G) Comparative genomic hybridization profile showing complex profile similar to a sporadic melanoma.

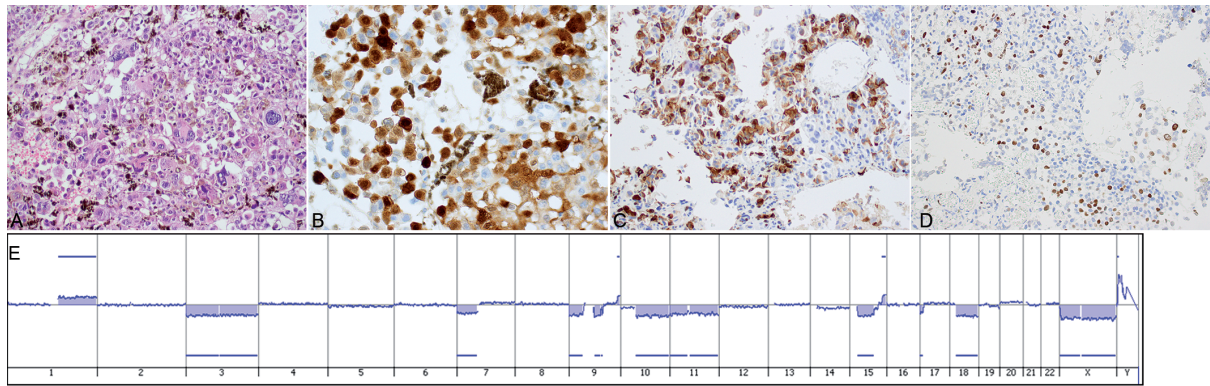


Fig. S3. Morphological illustration of a malignant melanoma on congenital melanocytic naevus with comparative genomic hybridization (CGH) data (patient 7). (A) Brain melanoma. Sheets of epithelioid pleomorphic large cells ( $\times 400$ ). (B) Immunohistochemistry with p16 showing both cytoplasmic and nuclear expression ( $\times 400$ ). (C) Immunohistochemistry with HMB45 showing heterogeneous cytoplasmic positivity ( $\times 200$ ). (D) Ki67 evaluation showing a low proliferative index ( $\times 200$ ). (E) CGH profile showing complex profile similar to sporadic melanoma.

Table SI. Clinical data

Pat. No.	Sex	Naevus location	Age of first naevus excision	Age at melanoma diagnosis	Melanoma location	Outcome
1	F	Bathing-trunk Satellite naevi	7.5 years	9.5 years Clinical stage II	Cutaneous	Metastatic axillary and inguinal lymph nodes Alive 10 years after excision
2	M	Back, neck, left arm and hand Satellite naevi	7 days	5 years Clinical stage II	Cutaneous	Sub-cutaneous, cerebral and lymph nodes metastasis Died (11 years) after 6 years excision and chemotherapy
3	F	Face	3 months	7 years Clinical stage IV	Cutaneous	Cerebral metastasis Died (7.5 years) after 6 months subtotal excision, chemotherapy and radiotherapy
4	F	Abdomen Satellite naevi	2 years	5 years Clinical stage III	Lymph node (No cutaneous melanoma diagnosed)	Metastatic inguinal lymph nodes revealing disease Cerebral, bone marrow and digestive metastasis Died (5.5 years) 3 months after excision
5	M	Back Satellite naevi	1 year	1 year Clinical stage III	Lymph node	Metastatic axillary lymph nodes revealing disease Alive 26 years after excision and chemotherapy
6	M	Bathing-trunk Satellite naevi	3 months	21 years Clinical stage IV	Central nervous system	Died (22 years) 3 months after chemotherapy
7	M	Back and buttock	3 years	24 years Clinical Stage IV	Central nervous system	Died (24 years) 3 months after excision
8	F	Lateral chest Satellite naevi	No excision	27 years Clinical stage II	Cutaneous	Desmoïd tumour and nodular lesion within the naevus Alive 7 years after excision
9	F	Back	3 years (Partial)	33 years Clinical stage IV	Subcutis	Died (34 years) 3 months after excision
10	M	Right arm	No excision	57 years Clinical stage II	Cutaneous	Alive 10 years after excision

Table SII. *Histological and immunohistochemical data*

Case	Location	Size and type cells	Anisocytosis, anisonucleosis	Mitoses/mm <sup>2</sup>	Necrosis	Inflammation	MIB1	HMB45	P16
1	Dermis and subcutis	Large epithelioid cells	Marked	12	Yes	Yes	30%	80% Heterogeneous	100% Cytoplasmic
2	Intra-naevic lymph node	Medium to large lymphoblastoid cells	Moderate	3	Yes	Yes	5%	40% Heterogeneous	90% Nuclear
3	Dermis	Large epithelioid cells	Moderate	3	No	Yes	5%	95% Homogeneous	80% Nuclear and cytoplasmic
4	Lymph node	Large epithelioid cells	Marked	10	Yes	Yes	40%	95% Homogeneous	40% Nuclear
5	Lymph node	Large epithelioid cells	Marked	1	No	Yes	NR	95% Homogeneous	80% Nuclear and cytoplasmic
6	Cerebral	Large epithelioid cells	Marked	4	Yes	Yes	20%	80% Heterogeneous	60% Cytoplasmic
7	Cerebral	Large epithelioid cells	Marked	4	Yes	Yes	20%	80% Heterogeneous	40% Nuclear and cytoplasmic
8	Dermis (superficial and medium)	Large epithelioid and fusiform cells	Marked	0	No	No	5%	80% Heterogeneous	Negative
9	Subcutis	Large pleomorphic cells	Moderate	4	No	Yes	40%	80% Homogeneous	Negative
10	Dermis (superficial and medium)	Large epithelioid cells	Moderate	8	No	Yes	NI*	Negative	Negative

NI: Non interpretable because of Bouin fixed tissue.



Table SIII. Fluorescence in situ hybridization (FISH) and comparative genomic hybridization (CGH) data

Case	FISH	CGH
1	Generalized polysomy	enh(1)(pterq41)(q42.3qter),enh(2),enh(3),enh(4),enh(5)(pterp15.1),enh(6),enh(8),enh(9)(p22.1q21.13)(q33.3qter),enh(11), enh(12)(p11.23q13.2),enh(13),enh(14),enh(15)(q11.1q15.1),enh(16)(p11.2p11.1),enh(17)(q21.3),enh(18)(pterq11.2), enh(19)(pterq13.32),enh(20),amp(20)(q13.13),enh(21),enh(22)(q13.1qter),dim(X)
2	Generalized polysomy	/
3	Generalized polysomy	dim(1),dim(2),dim(3),dim(5),enh(6),enh(10),dim(11)(pterp15.2),dim(14),dim(17)(pterq24.2)dim(19),enh(20),enh(22)
4	/	enh(1)(q),enh(2),dim(3)(q),enh(4)(pterq13.1),dim(5),enh(6)(pterp12.1),enh(7),enh(8),dim(9),dim(11)(pterp15.1) (p14.3q13.1)(q14.1q23.3),dim(12)(q13.11q21.1)(q21.33qter),enh(13),dim(14),dim(16)(q),dim(17)(p),dim(18),dim(X) (p22.1p21.1)
5	/	/
6	Generalized polysomy	dim(5)(q),enh(8),dim(9)(p),dim(10)(pterp11.2)(q11.2qter),dim(13)(q14.2q31.1),enh(13)(q31.1q31.2)(q31.3q32.1) (q33.3qter), enh(16)(p),dim(16)(q),dim(18)(p11.3),enh(18)(p11.3p11.2),enh(22)(q12.2q12.3),dim(22) (q12.3q13.1),amp(22)(q13.1q13.3),dim(Y)(q)
7	/	enh(1)(q),dim(3),dim(7)(p),dim(9)(pterq21.33)(q21.33q22.31),enh(9)(q34.11qter),dim(10)(q),dim(11),dim(15)(q11.2q23) (q24.2q24.3),enh(15)(q26.1qter),dim(17)(pterp13.1),dim(18)(q)
8	Trisomy 1 and 6	enh(8),enh(9),enh(10),enh(12),dim(14),dim(19),dim(21)
9	Gain of RREB1	/
	Loss of MYB	/
10	/	/