Ramazzini Days 2020

Carcinogenicity bioassay on Sprague-Dawley rats exposed from prenatal life until natural death to EMF generated by 1.8 GHz frequency

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RFR: experimental project

All experiments started at the 12° day of pregnancy and continued life-span

Experiment	Number of animals (M+F)	Treatment	State of the art *
			Published (partially)
BT 1 CEMRF	2,448	RFR 1.8 GHz	
BT 3 CEMRF	617	RFR/MW 1.8 GHz + γ-radiation (0.1 Gy)	Ongoing
TOTAL	**3,065**		

RFR: study design

Istituto "B. Ramazzini"

ANIMAL MODEL

Sprague-Dawley rats

FREQUENCY OF SIGNAL MODULATION

1800 MHz

STUDY GROUPS AND EXPOSURE

I group: 50 V/m (202 F, 207 M)

II group: 25 V/m (202 F, 209 M)

III group: 5 V/m (410 F, 401 M)

IV group: 0 V/m (405 F, 412 M)

TIME OF EXPOSURE

continuous exposure
19 hours/day, 7 days/week

RFR: exposure system

To expose the animals to a mobile phone radiofrequency field representative of a 1.8 GHz base station, a specific radiation system, totally representative of the real environmental situation present in geographic areas close to GSM base station radiation emissions

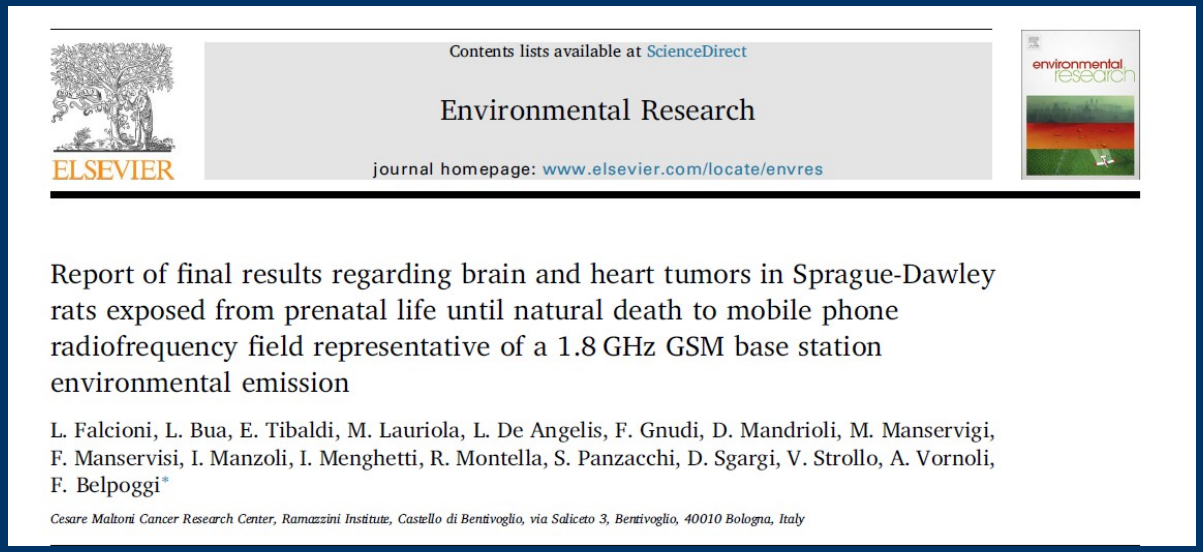
RFR: brain and heart results

- **Heart**

Statistically significant increase in malignant Schwannoma in males at the highest dose (50 V/m). Increase in Schwann cell hyperplasia in exposed male and female rats.

- **Brain**

Slight non-statistically significant dose-related increase in malignant glioma in exposed female rats



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Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission

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RFR: Total Benign Tumors

Group No.	Dose EMF-GSM 1.8GHz (V/m)	Animals		Benign tumours			
				Tumour-bearing animals		Tumours	
		Sex	No.	No.	%	No.	Per 100 animals
I	0	M	412	267	64.8	368	89.3
	(control)	F	405	328	81.0	783	193.3
		M+F	817	595	72.8	1151	140.9
II	5	M	401	213	53.3	304	76.0
		F	410	300	73.2	655	159.8
		M+F	811	513	63.3	959	118.2
III	25	M	209	123	58.9	182	87.1
		F	202	152	75.2	330	163.4
		M+F	411	275	66.9	512	124.6
IV	50	M	207	132	63.8	186	89.9
		F	202	149	73.8	359	177.7
		M+F	409	281	68.7	545	133.3

RFR: Total Malignant Tumors

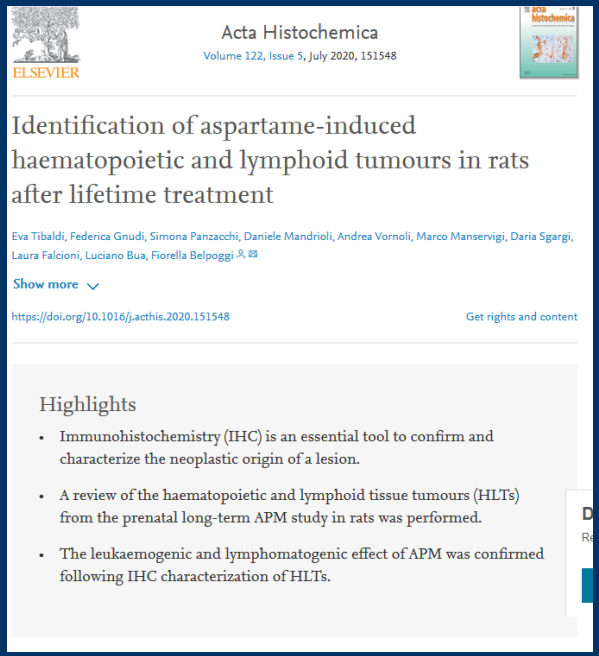
Group No.	Dose EMF-GSM 1.8GHz (V/m)	Animals		Malignant tumours			
				Tumour-bearing animals		Tumours	
		Sex	No.	No.	%	No.	Per 100 animals
I	0 (control)	M	412	122	29.6	134	32.5
		F	405	176	43.5	218	53.8
		M+F	817	299	36.6	354	43.3
II	5	M	401	128	32.0	138	34.5
		F	410	180	43.9	225	54.9
		M+F	811	308	38.0	363	44.8
III	25	M	209	47	22.5	50	23.9
		F	202	93	46.0	118	58.4
		M+F	411	140	34.1	168	40.9
IV	50	M	207	68	32.9	82	39.6
		F	202	85	42.1	107	53.0
		M+F	409	153	37.4	189	46.2

RFR: characterization of lymphoma and leukemia

All the cases reviewed based on:

1) **Updated pathological morphology criteria (HE staining) as indicated in a new international classification INHAND shared by pathologists from STP, ESTP, BSTP and JSTP**

2) **IHC analysis for the identification of the tumour cell lineage (i.e. B-cell /PAX5/CD20, T-cell/CD3/CD4, lymphoblastic cells/TdT) and for the evaluation of the degree of neoplastic cell proliferation (Ki67).**



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Identification of aspartame-induced haematopoietic and lymphoid tumours in rats after lifetime treatment

Eva Tibaldi, Federica Gnudi, Simona Panzacchi, Daniele Mandrioli, Andrea Vornoli, Marco Manservigi, Daria Sgargi, Laura Falcioni, Luciano Bua, Fiorella Belpoggi

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https://doi.org/10.1016/j.acthis.2020.151548

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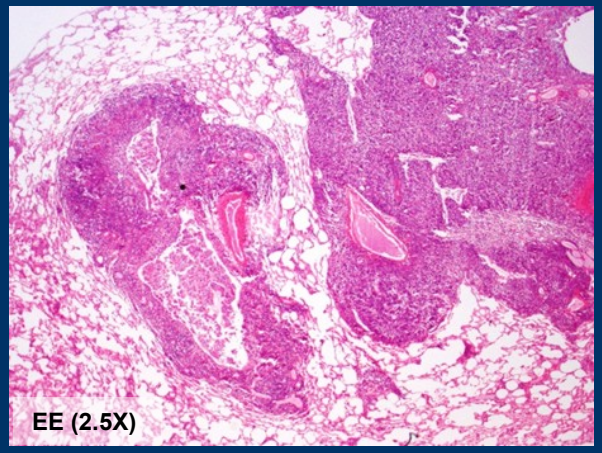
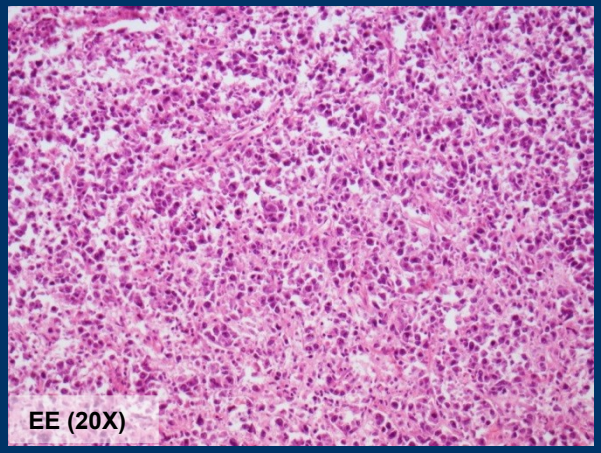
Highlights

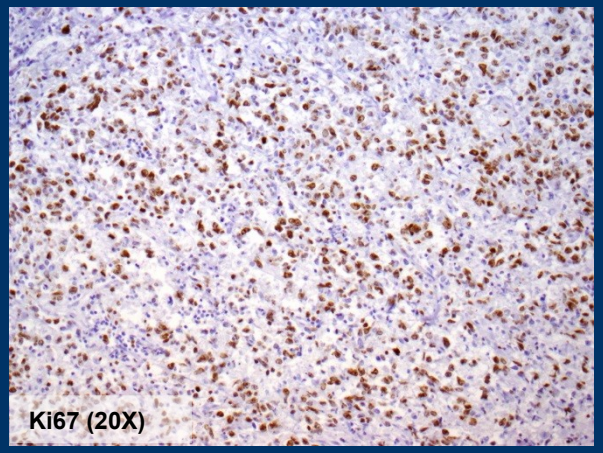
- Immunohistochemistry (IHC) is an essential tool to confirm and characterize the neoplastic origin of a lesion.
- A review of the haematopoietic and lymphoid tissue tumours (HLTs) from the prenatal long-term APM study in rats was performed.
- The leukaemogenic and lymphomatogenic effect of APM was confirmed following IHC characterization of HLTs.

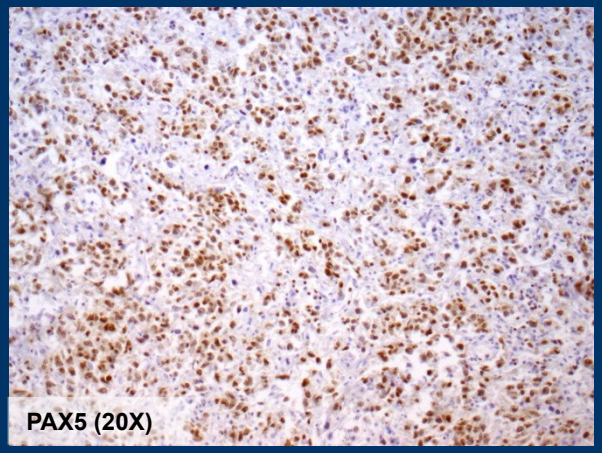
Immunoblastic lymphoma

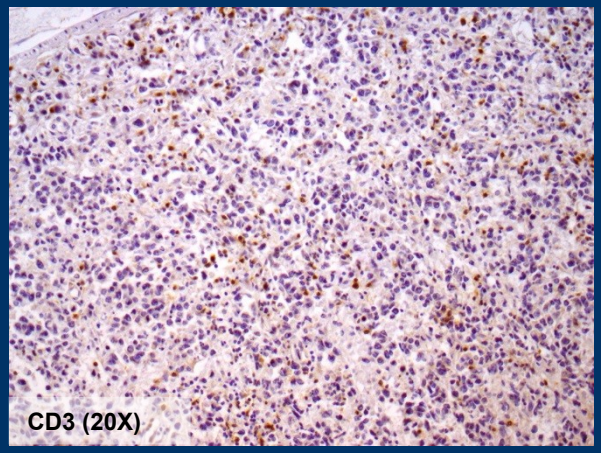
Primary site: lung;
other organs involved: none;
type: B-cells;
histotype: immunoblastic lymphoma (PAX5 +, TdT +, CD3 -)

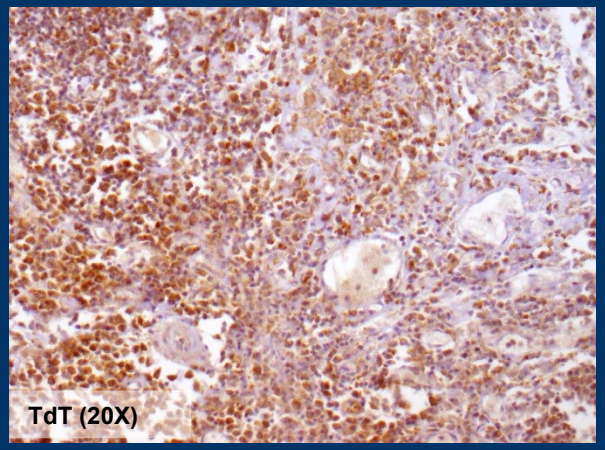












RFR: state-of-the-art

- Morphological analysis (H&E) completed for total tumors at all dose groups for BT1CEMRF. Identification and molecular characterization of lymphoma and leukemia is currently ongoing for BT1CEMRF.
- Statistical evaluation of neoplastic lesions and developmental parameters is currently ongoing for BT1CEMRF.
- Ongoing histopathological evaluation for BT3CEMRF.

Thank you!