
**MULTIPHASE COMBINED TREATMENT FOR ADULTS WITH
GBM, INCLUDING INDIVIDUALIZED MULTIMODAL
IMMUNOTHERAPY: SINGLE INSTITUTE REAL WORLD
MEDICAL DATA IN THE LIGHT OF CLINICAL TRIAL
RESEARCH DATA - ESHO 2023 PRESENTATION**

**STEFAN W. VAN GOOL, PETER VAN DE VLIET, LINDE KAMPERS, JENNIFER KOSMAL,
TOBIAS SPRENGER, VOLKER SCHIRRMACHER, WILFRIED STÜCKER**

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Oncothermia Journal 34, June 2024: 19 – 26.

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Multiphase combined treatment for adults with GBM, including individualized multimodal immunotherapy:

Single institute real world medical data
in the light of clinical trial research data

Stefaan W. Van Gool, Peter Van de Vliet, Linde Kampers, Jennifer Kosmal,
Tobias Sprenger, Volker Schirmacher, Wilfried Stücker



Individualized Multimodal Immunotherapy for Adults with IDH1 Wild-Type GBM: A Single Institute Experience

Stefaan W. Van Gool ^{*}, Jennifer Makalowski, Peter Van de Vliet, Stefanie Van Gool, Tobias Sprenger [†], Volker Schirmacher [‡] and Wilfried Stuecker



The Application of Evidence-Based Medicine in Individualized Medicine

Peter Van de Vliet ^{*}, Tobias Sprenger, Linde F. C. Kampers [†], Jennifer Makalowski [‡], Volker Schirmacher [‡], Wilfried Stücker and Stefaan W. Van Gool [‡]

Editorial Commentary Translational Cancer Research, 2023

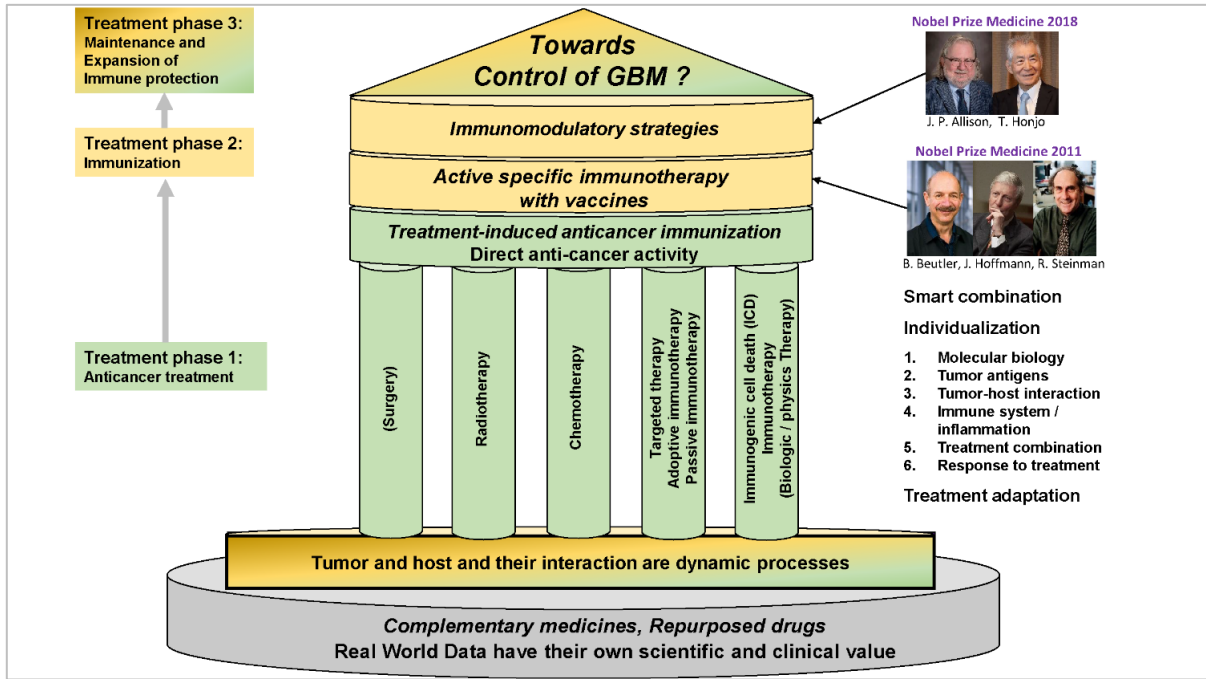
Dendritic cell vaccination for glioblastoma multiforme patients: has a new milestone been reached?

Stefaan W. Van Gool ^{*}, Jennifer Makalowski, Linde F. C. Kampers, Peter Van de Vliet, Tobias Sprenger, Volker Schirmacher, Wilfried Stücker

[Instruction: Revises AQ: Kindly note we have followed US spelling for this series. Hence, the correction "Towards" has not been followed in chapter title and retained the word "Toward" as is. Please check and confirm is this fine.]Methods behind oncolytic virus-based DC vaccines in cancer: Toward a multiphase combined treatment strategy for Glioblastoma (GBM) patients

Stefaan W. Van Gool ^{*}, Jennifer Makalowski, Peter Van de Vliet, Linde F. C. Kampers, Jennifer Kosmal, Tobias Sprenger, Frits Bos, Volker Schirmacher, Wilfried Stücker

HOZB, Cologne, Germany; Amgen, onkologisches Zentrum Köln, Cologne, Germany; Methods in Cell Biology, in press



Treatment phase 1: Anticancer treatment

ORIGINAL ARTICLE

Radiotherapy plus Concomitant and Adjuvant Temozolomide for Glioblastoma

Roger Stupp, M.D., Warren P. Mason, M.D., Martin J. van den Bent, M.D., Michael Weller, M.D., Barbara Fisher, M.D., Martin J. Taylor, M.D., Karl Berger, M.D., Alia A. Brandes, M.D., Christine Mawada, M.D., Ulrich Hegger, M.D., Jürgen Gerschlager, M.D., Robert C. Janzer, M.D., Samuel R. Lachy, M.D., Thierry Gorlia, M.Sc., Anshu Alghoni, Ph.D., Dennis Lacombe, M.D., Gregory Cotelevski, M.D., Elizabeth Eisenhauer, M.D., and René O. Miralbell, M.D., for the European Organisation for Research and Treatment of Cancer Brain Tumor and Radiotherapy Groups and the National Cancer Institute of Canada Clinical Trials Group

Lancet Oncol, 2009

Effects of radiotherapy with concomitant and adjuvant temozolomide versus radiotherapy alone on survival in glioblastoma in a randomised phase III study: 5-year analysis of the EORTC-NCIC trial

Roger Stupp, Monika F. Hegi, Warren P. Mason, Martin J. van den Bent, Martin J. Taylor, Robert C. Janzer, Samuel R. Lachy, Anshu Alghoni, Barbara Fisher, Karl Berger, Peter Hain, Alia A. Brandes, Jürgen Gerschlager, Christine Mawada, Charles J. Friebo, Kristina Aghajanian, Peter Wesseling, Schoder Vilas, Elizabeth Eisenhauer, Thierry Gorlia, Michael Weller, Denis Lacombe, J. Gregory Cotelevski, René Olivier Miralbell, on behalf of the European Organisation for Research and Treatment of Cancer Brain Tumour and Radiotherapy Oncology Groups and the National Cancer Institute of Canada Clinical Trials Group

Dose-Dense Temozolomide for Newly Diagnosed Glioblastoma: A Randomized Phase III Clinical Trial

Mark R. Gilbert, Meihua Wang, Kenneth D. Aldape, Roger Stupp, Monika E. Hegi, Kurt A. Jaeckle, Terri S. Armstrong, Jeffrey S. Wefel, Minhee Won, Deborah T. Blumenthal, Anita Mahajan, Christopher J. Schultz, Sara Erridge, Brigitta Baumert, Kristen I. Hopkins, Tzahala Tsak, Simon Paul D. Brown, Anshu Chakravarti, Walter J. Curran Jr, and Mitesh P. Mehta

JCO, 2013

A Randomized Trial of Bevacizumab for Newly Diagnosed Glioblastoma

Mark R. Gilbert, M.D., James J. Dignam, Ph.D., Terri S. Armstrong, Ph.D., A.N.P.-B.C., Jeffrey S. Wefel, Ph.D., Deborah T. Blumenthal, M.D., Michael A. Vogelbaum, M.D., Ph.D., Howard Colman, M.D., Ph.D., Anshu Chakravarti, M.D., Stephanie Pugh, Ph.D., Minhee Won, M.A., Robert Jeraj, Ph.D., Paul D. Brown, M.D., Kurt A. Jaeckle, M.D., David Schiff, M.D., Volker W. Stieber, M.D., David G. Brachman, M.D., Maria Werner-Wasik, M.D., Ivo W. Tremont-Lukats, M.D., Erik P. Sulman, M.D., Kenneth D. Aldape, M.D., Walter J. Curran, Jr., M.D., and Mitesh P. Mehta, M.D.

NEJM, 2014

Rindopemut with temozolomide for patients with newly diagnosed, EGFRvIII-expressing glioblastoma (ACT IV): a randomised, double-blind, international phase 3 trial

Michael Weller, Nicholas Butowski, David D. Tri, Lawrence D. Recht, Michael Lim, Hal Hric, Lynn Ashby, Lando Mochter, Samuel A. Goldust, Fabio Invernizzi, Jan Drozdzal, Donald M. Brouk, Mark Wong, Mark G. Hamilton, Gaetano Finocchiaro, James Perry, Wolfgang Wick, Jennifer Green, Yi Ho, Christoph D. Tonn, Michael Yellin, Tibor Keller, Thomas A. Davis, Roger Stupp, and John H. Sampson, for the ACT IV trial investigators

Lancet Oncol, 2017

JAMA Oncology | Original Investigation

Association of Autologous Tumor Lysate-Loaded Dendritic Cell Vaccination With Extension of Survival Among Patients With Newly Diagnosed and Recurrent Glioblastoma

JAMA Oncol, 2023

Phase III

A Randomized Double-Blind Placebo-Controlled Phase II Trial of Dendritic Cell Vaccine ICT-107 in Newly Diagnosed Patients with Glioblastoma

Patrick Y. Wen¹, David A. Reardon², Terri S. Armstrong³, Surasak Phuphanich⁴, Robert D. Aiken⁵, Joseph C. Landoil⁶, William T. Curry⁷, Jay-Jiguang Zhu⁷, Michael Giantz⁸, David M. Peereboom⁹, James M. Markert¹⁰, Renato LaRocca¹¹, Donald M. O'Rourke¹², Karen Fink¹³, Lyndon Kim¹⁴, Michael Gruber¹⁵, Glenn J. Lesser¹⁶, Edward Pan¹⁷, Santosh Kesari¹⁸, Alona Muzikansky¹⁹, Ciemencia Prilla²⁰, Radleigh G. Santos²⁰, and John S. Yu^{21,22,23}

CCR, 2019

ECA

**Treatment phase 1:
Anticancer treatment**

frontiers
in Oncology

REVIEW
SUBMITTED 11 APRIL 2022
ACCEPTED FOR PUBLICATION 22 APRIL 2022

Brain tumor immunotherapy: what have we learned so far?

Stefaan Willy Van Gool*

ANTICANCER RESEARCH 39: 2043-2051 (2019)
doi:10.21873/anticancer.13315

Immune Phenotype Correlates With Survival in Patients With GBM Treated With Standard Temozolomide-based Therapy and Immunotherapy

MARKOS ANTONOPOULOS¹, STEFAAN W. VAN GOOL², DIMITRA DIONYSIOU¹, NORBERT GRAF³ and GEORGIOS STAMATAKOS¹

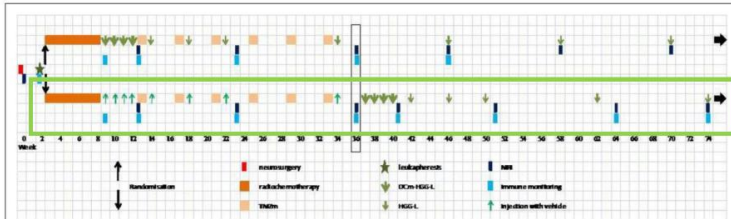


FIGURE 5 | Outline of the phase IIb randomized clinical trial HGG-2010.

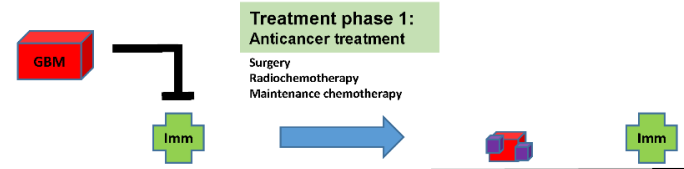
Table 1. Overall survival (OS) data of the total study population and subgroups residual tumor volume (RTV).

Patient group	No. of patients	Median OS (months)	2-Year OS rate (%)	95%CI
Total group	101	19	33.66	24.66-42.88
Early vaccination, RTV=0	19	22	40.2	18.4-61.2
Late vaccination, RTV=0	29	23	44.8	26.5-61.5
Early vaccination, RTV>0	28	19	25	11-41.7
Late vaccination, RTV>0	25	16	28	12.4-46

240
Neuro-Oncology
2021, 240: 250, 2021 | doi:10.1093/neuonc/noaa247 | Advance Access date 1 November 2020

DNA methylation based glioblastoma subclassification is related to tumoral T-cell infiltration and patient survival

Joost Dejaegher¹, Lien Solie, Zoë Hunin, Raf Sciôt, David Capper, Christin Siewert, Sofie Van Cauter, Guido Willems, Johan van Loon, Nadine Ectors, Steffen Flauwus, Stefan M. Pfister, Stefaan W. Van Gool, and Steven De Vleeschouwer



Cellular immunity of patients with malignant glioma: prerequisites for dendritic cell vaccination immunotherapy

J Neurosurg, 2006

Marion Rapp¹, Zakir Ozcan, Hans-Jakob Steiger, Peter Wernet, Michael C Sabel, Rüdiger V Sorg

Malignant Gliomas as Second Neoplasms in Pediatric Cancer Survivors: Neuropathological Study

BioMed Res Int, 2018

Ewa Izycka-Swieszewska¹, Ewa Bien², Joanna Stefanowicz², Edyta Szurowska³, Ewa Szutowicz-Zielinska⁴, Magdalena Koczkowska⁵, Dawid Sigorski⁶, Wojciech Kloc^{7,8}, Wojciech Rogowski⁹, and Elzbieta Adamkiewicz-Drozynska²

Tumor Microenvironment and Immune Escape in the Time Course of Glioblastoma

Mol Neurobiol, 2022

Assunta Virtuoso^{1,2}, Ciro De Luca¹, Giovanni Cirillo¹, Matteo Riva^{3,4}, Gabriele Romano⁵, Angela Bentivegna², Marialuisa Lavitrano², Michele Papa^{1,6}, Roberto Giovannoni⁷

Neuro-Oncology Advances

4(1), 1-14, 2022 | https://doi.org/10.1093/neoajnl/vdac076 | Advance Access date 23 May 2022

Neuro-Oncol Adv, 2022

Detection of temozolomide-induced hypermutation and response to PD-1 checkpoint inhibitor in recurrent glioblastoma

Paul Daniel, Brian Meehan, Siham Sabri, Fatemeh Jamali, Jann N. Sarkaria¹, Dongsic Choi, Delphine Garnier, Gaspar Kitange, Kate I. Glennon, Antoine Paccard, Jason Karamchandani, Yasser Riazalhosseini, Janusz Rak¹, and Bassam Abdulkarim¹

Impact of Radiochemotherapy on Immune Cell Subtypes in High-Grade Glioma Patients

Front Oncol, 2020

Valérie Dutoit^{1,2*}, Géraldine Philippin^{1,2}, Valérie Widmer^{1,2}, Eliana Marinari^{1,2}, Aurélie Vuilleumier³, Denis Migliorini^{1,2}, Karl Schaller¹ and Pierre-Yves Dietrich^{1,2,3}

Treatment phase 1: Anticancer treatment
Surgery
Radiochemotherapy
Maintenance chemotherapy
ICD Immunotherapy

Treatment phase 2: Immunization
Active specific Immunotherapy
Modulatory immunotherapy

Consensus guidelines for the definition, detection and interpretation of immunogenic cell death
JTC, 2020

Lorenzo Galluzzi,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000}

J Neurooncol (2010) 98:395–405
DOI 10.1007/s11060-009-0093-0

CLINICAL STUDY - PATIENT STUDY

Transcranial electro-hyperthermia combined with alkylating chemotherapy in patients with relapsed high-grade gliomas: phase I clinical results

Caecilia Wismeth · Christine Dudel · Christina Pascher · Paul Ramm · Torsten Pietsch · Birgit Hirschmann · Christiane Reinert · Martin Proescholdt · Petra Rümmele · Gerhard Schuierer · Ulrich Bogdahn · Peter Hau

OPEN Newcastle disease virus enhances the growth-inhibiting and proapoptotic effects of temozolomide on glioblastoma cells in vitro and in vivo

Received: 7 November 2017
Accepted: 9 July 2018
Published online: 31 July 2018

Yang Bai¹, Yong Chen¹, Xinyu Hong¹, Xinrui Liu¹, Xing Su², Shanji Li¹, Xuechao Dong¹, Gang Zhao³ & Yunqian Li¹

Treatment phase 1: Anticancer treatment
Surgery
Radiochemotherapy
Maintenance chemotherapy
ICD Immunotherapy

Treatment phase 2: Immunization
Active specific Immunotherapy
Modulatory immunotherapy

1 Clinical Efficacy of Tumor Antigen-Pulsed DC Treatment for High-Grade Glioma Patients: Evidence from a Meta-Analysis PLOS-One, 2014

Jun-Xia Cao^{1,2*}, Xiao-Yan Zhang¹, Jin-Long Liu¹, Duo Li¹, Jun-Li Li¹, Yi-Shan Liu¹, Min Wang¹, Bei-Lei Xu¹, Hai-Bo Wang¹, Zheng-Xu Wang^{1*}

3 Therapeutics and Clinical Risk Management Dovepress

Dendritic cell vaccines for high-grade gliomas Eagles ME, et al, 2018

5 CLINICAL CANCER RESEARCH | PERSPECTIVES

Once, Twice, Three Times a Finding: Reproducibility of Dendritic Cell Vaccine Trials Targeting Cytomegalovirus in Glioblastoma CCR, 2020

Kristen A. Batch^{1,2,3}, Duane A. Mitchell^{4,5}, Patrick Healy^{1,6}, James E. Herndon II^{1,6}, and John H. Sampson^{1,3}

2 Dendritic Cell-Based Vaccine for the Treatment of Malignant Glioma: A Systematic Review Cancer Invest, 2014

Xuan Wang, Hong-Yang Zhao, Fang-Cheng Zhang, Yun Sun, Zhi-Yong Xiong & Xiao-Bing Jiang

4 Assessment of efficacy of dendritic cell therapy and viral therapy in high grade glioma clinical trials. A meta-analytic review JIJ, 2019

Bogdan Ionel Vatu, Stefan-Alexandru Artene, Adeline-Georgiana Staicu, Adina Turcu-Stiolicca, Catalin Folcuti, Alexandra Dragoi, Catalina Cioc, Stefania-Carina Baloi, Ligia Gabriela Tataranu, Cristian Silosi & Anica Dricu

6 International Immunopharmacology journal homepage: www.elsevier.com/locate/intimp

Efficacy and safety of dendritic cell vaccines for patients with glioblastoma: A meta-analysis of randomized controlled trials IIP, 2020

Li Lv¹, Jianguo Huang¹, Haipeng Xi, Xiangyang Zhou¹

Department of Neurosurgery, First Affiliated Hospital, University of South China, Hengyang 421001, Hunan Province, China

Treatment phase 1: Anticancer treatment
Surgery
Radiochemotherapy
Maintenance chemotherapy
ICD Immunotherapy

Treatment phase 2: Immunization
Active specific Immunotherapy
Modulatory immunotherapy

Treatment phase 3: Maintenance and Expansion of Immune protection
ICD Immunotherapy

Modulatory immunotherapy

- Anti-inflammation: anti-HR1, Cox2 inhibitor, Curamun
- CPI if needed
- Risedronate

Neuron-Glioma axis

Metabolic cocktail

- Metformin
- Atorvastatin
- Mebendazol

Neuro-psycho-endocrino-immunology axis

Melatonin

Modulated Electrohyperthermia in Integrative Cancer Treatment for Relapsed Malignant Glioblastoma and Astrocytoma: Retrospective Multicenter Controlled Study
Integrative Cancer Therapy, 2018

Giammaria Fiorentini, MD¹, Donatella Sarti, PhD¹, Carlo Mlandri, MD¹, Patrizia Dentico, MD², Andrea Mambriani, MD³, Caterina Fiorentini, MD⁴, Giuseppina Nascetti, MD⁵, Virginia Casadei, MD and Stefano Guadagni, MD⁶

Dendritic cell-based immunotherapy targeting Wilms' tumor 1 in patients with recurrent malignant glioma
J Neurosurg, 2015

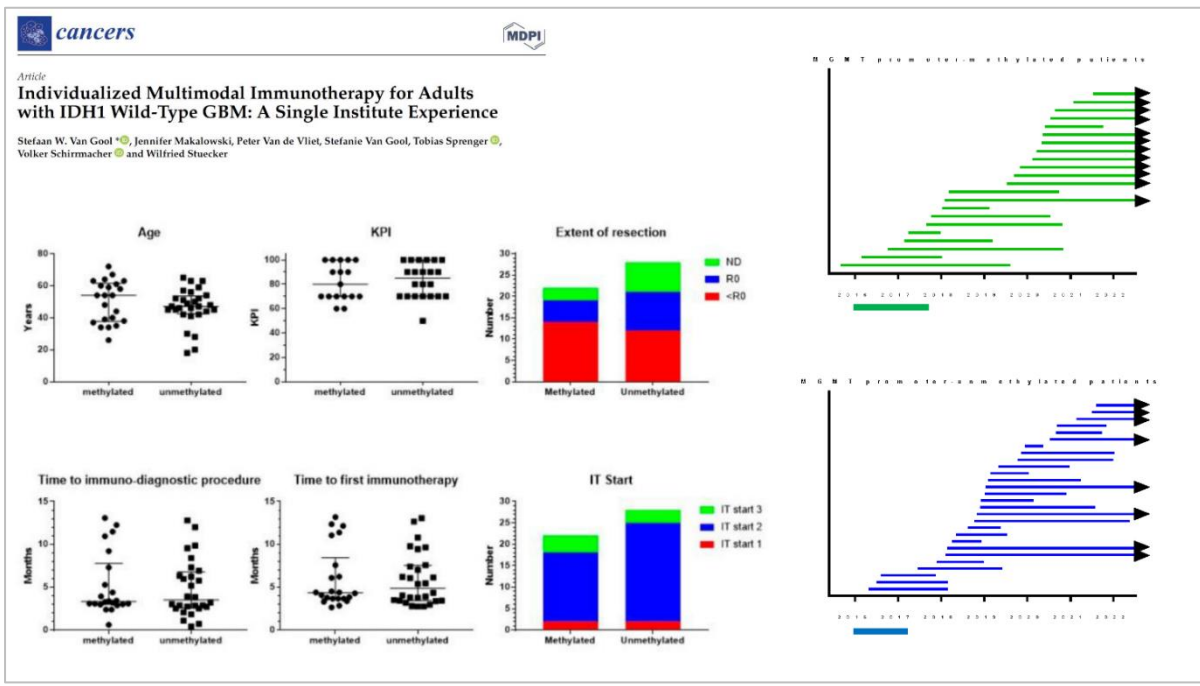
Koichi Sakai, MD, PhD^{1,†}, Shigetaka Shimodaira, MD, PhD², Shinya Maejima, MD, PhD², Nobuyuki Udagawa, DDS, PhD², Kenji Sano, MD, PhD², Yumiko Higuchi, PhD², Terutsugu Koya, MS¹, Takanaga Ochiai, DDS, PhD², Masanori Koide, DDS, PhD¹, Shunsuke Uehara, PhD¹, Mildori Nakamura, DDS, PhD², Haruo Sugiyama, MD, PhD², Yoshikazu Yonemitsu, MD, PhD¹, Masato Okamoto, DDS, PhD^{1,†} and Kazuhiro Hongo, MD, PhD¹

Phase I/II Trial of Intravenous NDV-HUJ Oncolytic Virus in Recurrent Glioblastoma Multiforme
Molecular Therapy, 2006

Arnold I. Freeman,¹ Zichria Zakay-Rones,² John M. Gomori,³ Eduard Linetsky,^{4,5} Linda Rasooly,¹ Evgeniya Greenbaum,² Shira Rozenman-Yair,⁶ Amos Panet,² Eugene Libson,⁷ Charles S. Irving,⁶ Eithan Galun,^{1,4} and Tali Siegal¹

Phase IIa Study of SurVaxM Plus Adjuvant Temozolomide for Newly Diagnosed Glioblastoma
JCO, 2023

Munneet S. Ahluwalia, MD¹; David A. Reardon, MD²; Ajay P. Abad, MD³; William T. Curry, MD⁴; Eric T. Wong, MD⁵; Sheila A. Figg, PhD⁶; Lucio L. Mechtler, MD⁷; David M. Peereboom, MD⁸; Alan D. Hutson, PhD⁹; Henry G. Wilkes, PhD⁹; Song Liu, PhD⁹; Ahmed N. Bekal, MD⁹; Jingxin Guo, MD, PhD¹⁰; Kathleen M. Mogensen, NP¹; Susan S. Dharmia, PhD¹; Andrew Dhanan, MD¹¹; Meaghan T. Birkenmeier, BS¹²; Danielle M. Casucci, BS¹²; Michael J. Ciesielski, PhD¹³; and Robert A. Fenstermaker, MD¹⁴



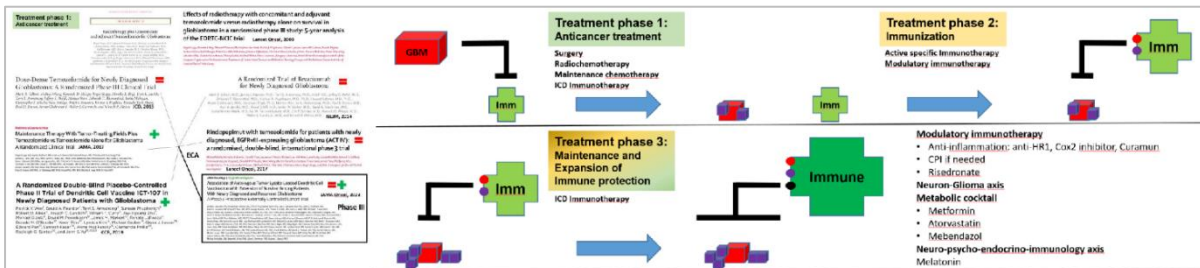


Table 3: Patient characteristics in the selected publications

	n	Median age	F/M (%)	Median KPI	Meth (%)	Unmeth (%)	R0 (%)	<R0 (%)	ND (%)
Gilbert [283]	411	>50	42/58	>90	30	62	46	44	0
Gilbert [284]	309	>50	37/63	>90	28	69	59	41	0
Stupp [228]	229	57	31/69	90	42	51	54	46	0
Weller [285]	374	58	39/61	>70	35	58	56	44	0
Wen [81]	43	60	28/72	>90	42	56	74	26	0
Liau [10, 11]	232	56	41/59	>90	39	56	63	37	0
Van Gool [106]	50	48	46/54	80	44	56	28	52	20

F: female; M: male; KPI: Karnofsky performance index; Meth: MGMT promoter-methylated; Unmeth: MGMT promoter-unmethylated; ND: not documented; R0: complete resection; <R0: less than complete resection

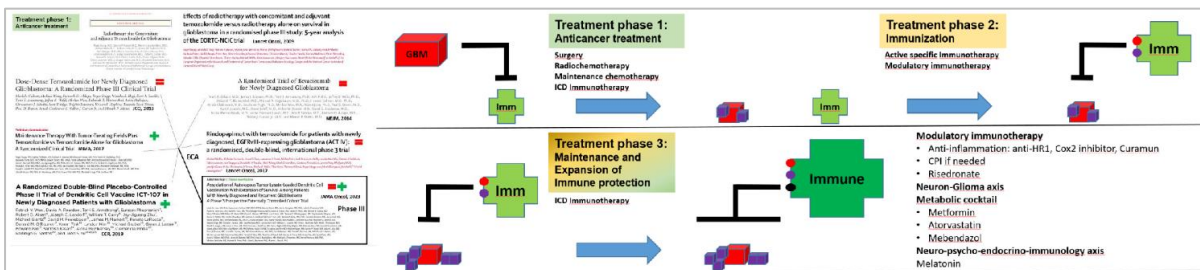


Table 4: Overall survival reported in selected publications

Reference		Unmethylated		Methylated	
		mOS (m)	2y OS (%)	mOS (m)	2y OS (%)
Stupp [195]	S + RT	11,8	1,8	15,3	23,9
	RCT	12,6	14,8	23,4	48,9
Stupp [228]	S + RCT + CT	14,7	22,1	21,2	37,7
	RCT	16,9	26,8	31,6	59,1
Liau [11]	S + RCT + CT	14,6	21	21,3	42
	ECA	14,9	19	30,2	58
Van Gool [106]	RWD	22,1	41,6	37,7	80,5

IMI: individualized multimodal immunotherapy; m: months; mOS: median overall survival RCT: randomized controlled trial; RDW: real-world data; S + RT: surgery + radiotherapy; S + RCT + CT: surgery + radiochemotherapy + chemotherapy; TTF: tumor-treating fields; 2y OS: two-year overall survival. Expected OS with standard of care treatment anno 2023 are marked in bold and gray background.

