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Ivermectin Has at Least 15 Anti-cancer Mechanisms of Action. Can It Treat COVID-19 mRNA Vaccine-Induced Turbo Cancers?

Nine Ivermectin papers reviewed

By Dr. William Makis
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COVID Intel

Theme: Science and Medicine

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Papers reviewed:

- 2023 Sep.23 – Man-Yuan Li et al – Ivermectin induces nonprotective autophagy by downregulating PAK1 and apoptosis in lung adenocarcinoma cells
- 2023 May – Samy et al – Eprinomectin: a derivative of ivermectin suppresses growth and metastatic phenotypes of prostate cancer cells by targeting the β-catenin signaling pathway
- 2022 Nov – Lotfalizadeh et al – The Anticancer potential of Ivermectin: Mechanisms of action and therapeutic implications
- 2022 Oct – Jian Liu et al – Progress in Understanding the Molecular Mechanisms Underlying the Antitumour Effects of Ivermectin
- 2022 Jun – Daeun Lee et al – Ivermectin suppresses pancreatic cancer via mitochondria dysfunction
- 2021 Aug – Shican Zhou et al – Ivermectin has New Application in Inhibiting Colorectal Cancer Cell Growth
- 2021 Jan – Mingyang Tang et al – Ivermectin, a potential anticancer drug derived from an antiparasitic drug
- 2019 Sep Intuyod et al – Anti-parasitic Drug Ivermectin Exhibits Potent Anticancer Activity Against Gemcitabine-resistant Cholangiocarcinoma *In Vitro*
- 2018 Feb – Juarez et al – The multitargeted drug ivermectin: from an antiparasitic agent to a repositioned cancer drug

2018 Feb – Juarez et al – The multitargeted drug ivermectin: from an antiparasitic agent to a repositioned cancer drug

- Satoshi Omura at the Kitasato Institute discovered Ivermectin in 1979 and was awarded a Nobel Prize in Physiology or Medicine for this discovery in 2015
- Ivermectin was FDA Approved for human use in 1987 to orally treat onchocerciasis, also known as river blindness, caused by the blackfly-transmitted parasite *Onchocerca volvulus*
- Ivermectin is annually taken by close to 250 million people
- most patients treated with Ivermectin have no side-effects other than those caused by the immune and inflammatory responses against the parasite, such as fever, pruritus, skin rashes and malaise
- maximum concentration in plasma is reached 4-5 h after its oral administration
- its half-life is approximately 19 h and is metabolized in the liver by the cytochrome CYP1A and CYP3A4 complexes, generating 10 metabolites, mostly demethylated and hydroxylated.
- Its excretion is mainly by feces and only 1% is excreted in the urine
- Ivermectin exerts antitumor effects in different types of cancer.

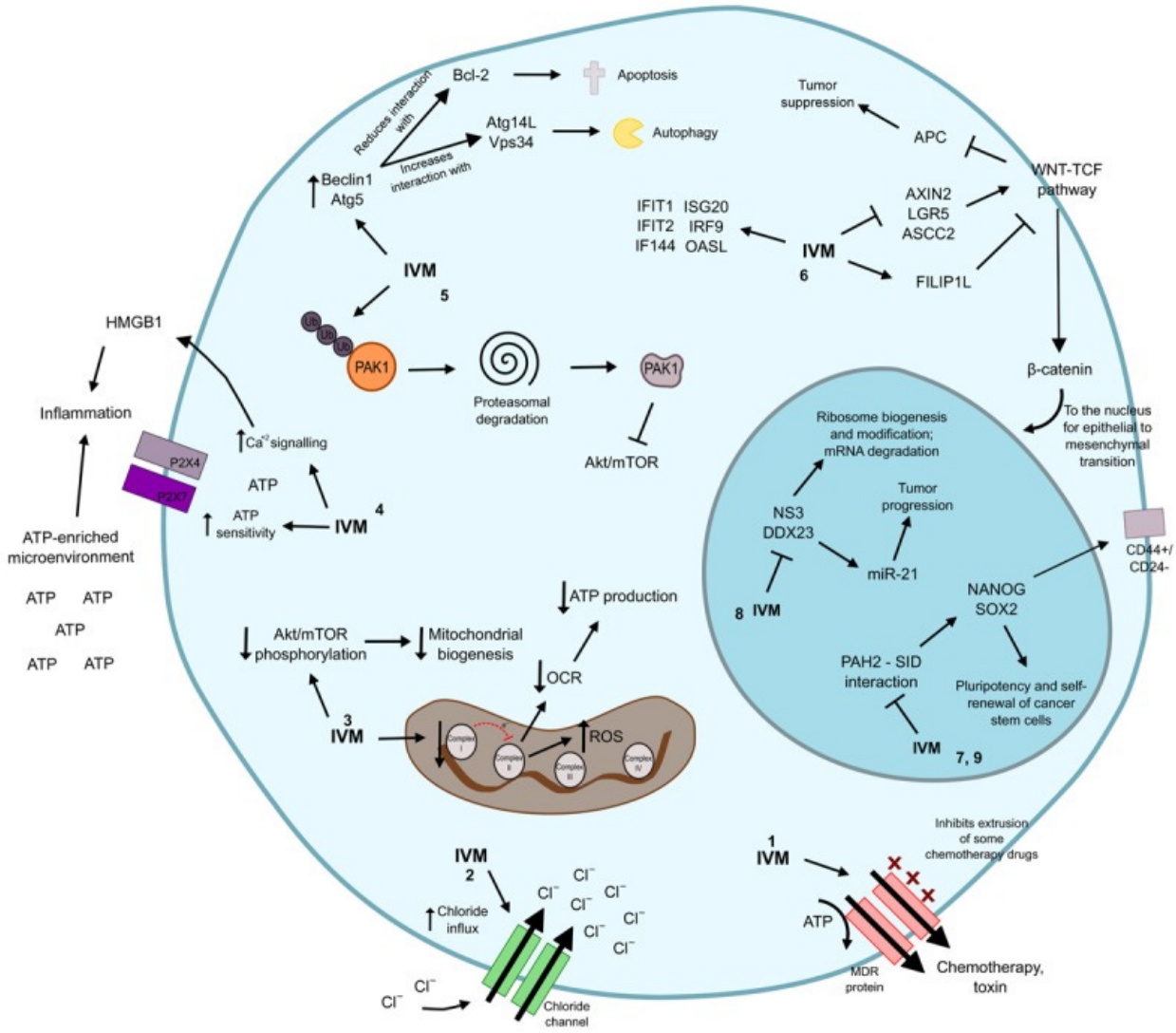


Table 2

Summary of the antitumor targets of ivermectin

Target	Effect	References
MDR protein	Inhibition	[39]
Chloride channel	Increase of activity	[44]
Akt/mTOR pathway	Inhibition	[47]
P2X7/P2X7 receptors	Activation	[50,51]
PAK1 protein	Inhibition	[9,54]
WNT-TCF pathway	Inhibition	[57,58]
SIN3 domain	Inhibition	[59]
NS3 DDX23 helicase	Inhibition	[64]
Nanog/Sox2/Oct4 genes	Downregulation	[67]

What this means clinically:

- Chloride channel – Acute myeloid leukemia – induced cell death
- Akt/mTOR path – glioblastoma, renal cancer cell lines – inhibition of mitochondrial biogenesis or function, oxidative stress, DNA damage
- P2X7 (ICD) overexpression promotes tumor growth and metastases – ivermectin potentiates immunogenic cell death (ICD) in triple negative breast cancer cells
- PAK1 (Autophagy) – glioblastoma and ovarian cancer cell lines – Ivermectin promotes autophagy through this pathway
- WNT-TCF pathway – glioblastoma, colon cancer, melanoma – Ivermectin exerts anti-proliferative function through this pathway (possibilities to use Ivermectin to block WNT-TCF dependent cancers like breast, skin, lung)
- SIN3 Domain – breast cancer (Ivermectin acts as epigenetic modulator to alter gene expression and decrease tumor growth)
- NS3 helicase – glioma cells – Ivermectin had anti-tumor effects by acting as helicase inhibitor

In Vitro studies:

- breast cancer, ovarian, prostate, colon, pancreas, head and neck, melanoma – inhibits cell proliferation, induction of apoptosis, autophagy, reversion of tamoxifen resistance, inhibits metastases
- glioblastoma – growth inhibition, apoptosis, and anti-angiogenesis

In Vivo Studies (done on immune deficient mice):

- acute myeloblastic leukemia – reduce tumor volume up to 70%
- glioblastoma – reduce tumor volume up to 50%
- breast cancer – reduce tumor volume up to 60%
- glioma – reduce tumor volume up to 50% (at 0.24mg/kg), however at human dose equivalent to 0.8mg/kg tumors were not detectable!
- colon cancer – reduce tumor volume up to 85%
- median dose employed was equivalent to 0.4 mg/kg in humans from 10 to 42 days (oral, intraperitoneal or intra-tumoral)
- the *in vitro* and *in vivo* antitumor activities of Ivermectin are achieved at concentrations that can be clinically reachable based on the human pharmacokinetic studies done in healthy and parasited patients

2019 Sep Intuyod et al – Anti-parasitic Drug Ivermectin Exhibits Potent Anticancer Activity Against Gemcitabine-resistant Cholangiocarcinoma *In Vitro*

- Ivermectin studied on cholangiocarcinoma cells that were chemo resistant (gemcitabine)
- Ivermectin inhibited cancer cell proliferation and colony formation in a dose and time dependent manner(!)
- Ivermectin caused S-phase cell cycle arrest and cell death
- Conclusion: "Ivermectin might be useful as an alternative treatment for cholangiocarcinoma, especially in patients who do not respond to chemo."

2021 Jan – Mingyang Tang et al – Ivermectin, a potential anticancer drug derived from an antiparasitic drug

- specific mechanism of IVM-mediated cytotoxicity in tumor cells is unclear; it may be related to the effect of IVM on various signaling pathways
- IVM seems to induce mixed cell death in tumor cells

Table 2. Summary of the anticancer mechanism of IVM

Mechanism	Cancer type	References
Inhibit Wnt pathway	Breast cancer, Colorectal cancer	[33,41]
Inhibit Akt/mTOR pathway	Breast cancer, Ovarian cancer, Glioma	[32,60,64]
Inhibit MAPK pathway	Nasopharyngeal carcinomaMelanoma	[69,73]
Inhibit YAP1 protein	Gastric cancer, liver cancer	[39,43]
Inhibit PAK1 protein	Breast cancer, Ovarian cancer, Nasopharyngeal carcinoma, Melanoma	[32,58,69,73,96]
Inhibit HSP27	Prostate cancer, Lung cancer Colorectal cancer	[50]
Induce mitochondrial dysfunction	Renal cell carcinoma, GliomaLeukemia	[48,53,63]
Inhibit cancer stem cells	Breast cancer	[95,96]
Inhibit p-glycoproteinand MDR protein	Colorectal cancer, Breast cancerLeukemia	[22,104]
Activate P2 × 7 receptor	Breast cancer	[37]
Inhibit SIN3 domain	Breast cancer	[36]
Inhibit DDX23 helicase	Glioma	[66]
Activate chloride channels	Leukemia	[51]
Increase TFE3 Activity	Melanoma	[74]
Inhibit KPNB1 protein	Ovarian cancer	[59]

- CONCLUSIONS: Ivermectin selectively inhibits the proliferation of tumors at a dose that is not toxic to normal cells and can reverse the MDR (multi-drug resistance) of tumors.
- In healthy volunteers, the dose was increased to 2 mg/kg, and no serious adverse reactions were found
- Unfortunately, there have been no reports of clinical trials of IVM as an anticancer drug
- large number of research results indicate that IVM affects multiple signaling pathways in tumor cells and inhibits proliferation, IVM may cause antitumor activity in tumor cells through specific targets
- Ivermectin regulates the tumor microenvironment, inhibits the activity of tumor stem cells and reduces tumor angiogenesis and tumor metastasis.
- It has become increasingly clear that Ivermectin can induce a mixed cell death mode involving apoptosis, autophagy and pyroptosis depending on the cell conditions and cancer type.

- Ivermectin can enhance the sensitivity of chemotherapeutic drugs and reduce the production of resistance. Therefore, IVM should be used in combination with other drugs to achieve the best effect

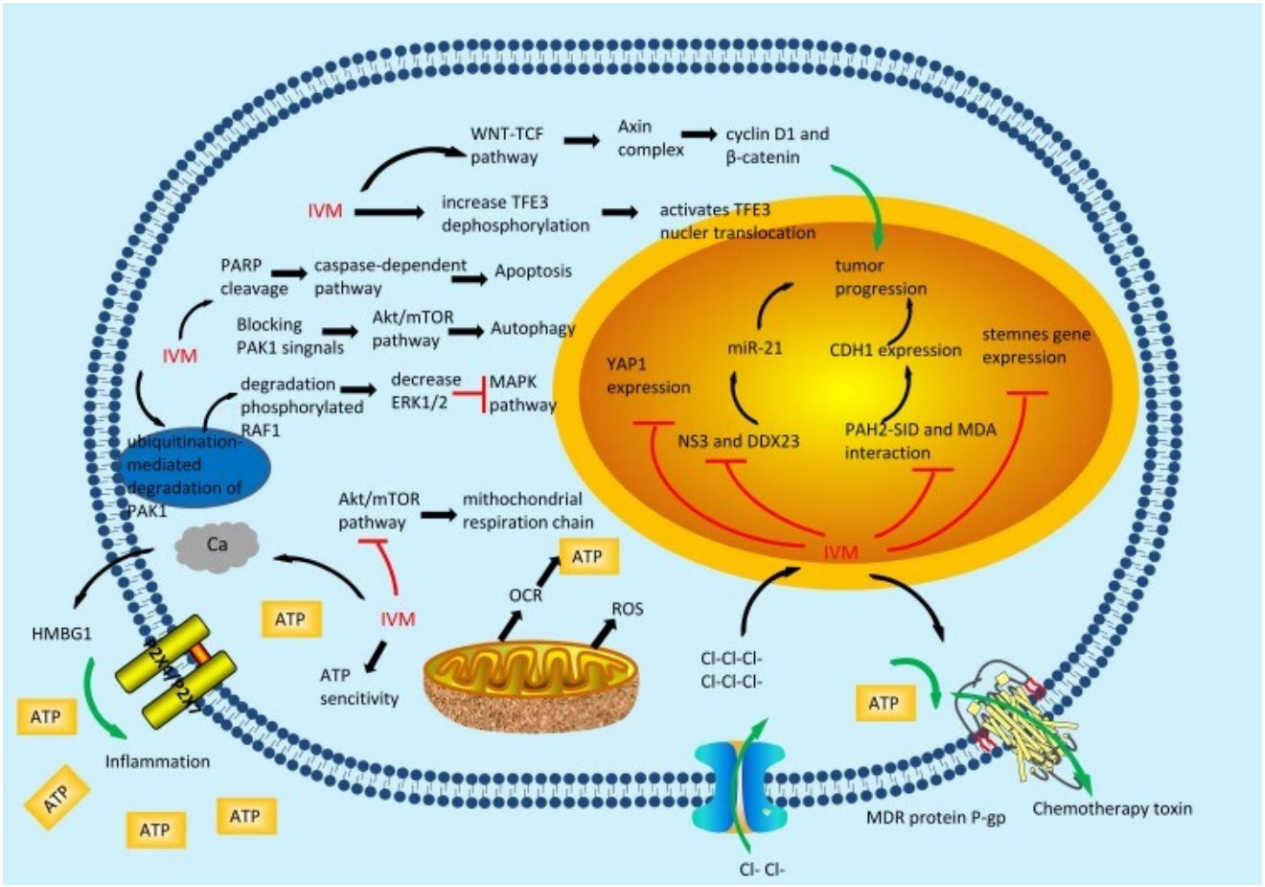
2022 Jun – Daeun Lee et al – Ivermectin suppresses pancreatic cancer via mitochondria dysfunction

- Poster presentation from South Korea
- Ivermectin was combined with gemcitabine in pancreatic cancer
- Ivermectin-gemcitabine combination inhibited pancreatic cancer cell proliferation via G1 arrest of cell cycle
- in vivo experiments showed ivermectin-gemcitabine significantly suppressed tumor growth of pancreatic cancer compared with gemcitabine alone
- Conclusion: "Ivermectin could be a potential antitumor drug for the treatment of pancreatic cancer"

2021 Aug – Shican Zhou et al – Ivermectin has New Application in Inhibiting Colorectal Cancer Cell Growth

- Colorectal cancer is 3rd most common cancer worldwide, lacks effective therapy
- Ivermectin tested on colorectal cancer cell lines
- Ivermectin dose-dependently inhibited colorectal cancer growth
    - promoted cell apoptosis
    - promoted total and mitochondrial ROS production (reactive oxygen species)
    - induced colorectal cancer cell S-phase arrest
- Conclusion: Ivermectin might be a new potential anticancer drug therapy for human colorectal cancer

2022 Oct – Jian Liu et al – Progress in Understanding the Molecular Mechanisms Underlying the Antitumor Effects of Ivermectin



- PAK1 (Autophagy) – Ivermectin, acts as PAK1 inhibitor and inhibits growth of breast cancer, ovarian cancer, glioblastoma and NF2 tumors and involved in cell death in Nasopharyngeal carcinoma and melanoma.
- Apoptosis (Caspase Dependent) – Ivermectin induces apoptosis in glioblastoma, chronic myeloid leukemia cells, also breast cancer, ovarian cancer.
- Immunogenic Cell Death (ICD – P2X7 signaling) – ivermectin induces cell death in triple negative breast cancer.
- YAP1 Inhibition – hepatocellular and cholangiocarcinoma, colorectal cancer, ovarian cancer, gastric cancer – ivermectin exerts anti-tumor effects
- WNT Path (cancer progression – differentiation, metastasis, cell senescence, tumor initiation, tumor growth) – Ivermectin inhibits this path – inhibits colon cancer and lung cancer, ivermectin also limits formation of cancer stem cells.
- TF3 Path – ivermectin stimulates apoptosis of melanoma cells.
- RNA Helicase Inhibition – ivermectin inhibits cell invasion and proliferation of glioma cells
- SID Peptide (SIN3A/B) – Ivermectin inhibits breast cancer progression, also restores tamoxifen sensitivity
- Akt/mTOR inhibition – Ivermectin inhibits mitochondrial respiration – glioblastoma, CML leukemia (some cancers like breast, leukemia and lymphoma are more metabolically active and depended on mitochondria – more responsive to ivermectin inhibition)
- ivermectin is an angiogenesis inhibitor
- ivermectin has anti-mitotic activity

In humans, toxicity of ivermectin is very low, no serious adverse reactions have been found in healthy volunteers at dose up to 120 mg (~2 mg/kg) (Reference: GuzzoCA, FurtekCI, PorrasAG, et al. Safety, tolerability, and pharmacokinetics of escalating high doses of

ivermectin in healthy adult subjects. *J Clin Pharmacol*. 2002;42(10):1122–1133.)

2023 May – Samy et al – Eprinomectin: a derivative of ivermectin suppresses growth and metastatic phenotypes of prostate cancer cells by targeting the β-catenin signaling pathway

- Ivermectin (derivative) inhibits prostate cancer cell viability, migration capacities
- Ivermectin induces apoptosis, autophagy (via ROS)
- Ivermectin downregulates expression of cancer stem cell markers
- Conclusion: Ivermectin has tremendous potential to target metastatic prostate cancer cells and provides new avenues for therapeutic approaches to advanced prostate cancer

2023 Sep.23 – Man-Yuan Li et al – Ivermectin induces nonprotective autophagy by downregulating PAK1 and apoptosis in lung adenocarcinoma cells

- Ivermectin was studied on lung adenocarcinoma cells
- Ivermectin strikingly impeded colony formation and viability of cancer cells, along with cell proliferation, caused apoptosis and enhanced autophagy
- Ivermectin efficiently suppressed cellular growth of lung adenocarcinoma cells in vivo among nude mice

My Take…

Ivermectin exerts anti-cancer effects through at least 15 different pathways proven in the medical literature, both in vitro and in vivo!

(You get a nice summary of these 15 pathways from the 2021 paper by Mingyang Tang et al.)

First, let's quickly summarize the anti-cancer mechanisms (a quick summary can be found in 2022 paper by Loftalizadeh et al):

- Ivermectin induces tumor cell death: apoptosis, autophagy, pyroptosis
- Ivermectin inhibits tumor initiation and tumor progression (via WNT inhibition, YAP1 inhibition)
- Ivermectin inhibits tumor growth and proliferation (via Akt/mTOR inhibition, MAPK inhibition)
- Ivermectin stops cancer cell migration, invasion and metastasis (via PAK1 inhibition – seen in 70% of all cancers, EMT inhibition, RNA Helicase inhibition)
- Ivermectin causes cancer cell mitochondrial dysfunction (inhibits mitochondrial biogenesis, increases reactive oxygen species selectively only in cancer cells)
- Ivermectin regulates tumor microenvironment (to inhibit tumor growth and progression, via P2X7 path, ICD – mediates immunogenic cell death)
- Ivermectin inhibits cancer stem cells (which are responsible for tumor initiation, progression and recurrence)
- Ivermectin inhibits tumor angiogenesis (tumor blood vessel creation)
- Ivermectin has anti-mitotic activity (interacts with mammalian tubulin)
- Ivermectin is an epigenetic regulator of cancer to inhibit cancer progression(alters gene expression to inhibit cancer progression, SIN3A, EMT)
- Ivermectin can overcome tumor multidrug resistance

What Cancers Can Ivermectin Treat?

The top 5 COVID-19 mRNA Vaccine Induced Turbo Cancers are: lymphomas, brain cancers, breast cancers, colon cancers and lung cancers (signals also seen in leukemias, hepatobiliary cancers, testicular cancers, sarcomas and melanomas)

Ivermectin has been shown to kill these cancer cells (in vitro or in vivo):

- breast cancer, especially triple negative breast cancer which is often seen in COVID-19 mRNA Vaccinated women and has the worst prognosis.
- glioblastoma and gliomas (glioblastomas are often seen in COVID-19 mRNA Vaccinated individuals)
- leukemias, both AML and CML (these are the most aggressive and quickly lethal mRNA Turbo Cancers)
- colorectal cancer (Stage 4 Colon cancers common in COVID-19 mRNA vaccinated)
- hepatobiliary cancers: hepatocecullar carcinoma, cholangiocarcinoma, pancreatic cancer (major signal with COVID-19 mRNA Vaccines)
- lung cancer (Stage 4 lung cancers in COVID-19 mRNA Vaccinated)
- melanoma (definite signal in COVID-19 mRNA vaccinated)
- renal cell cancer (possible signal with mRNA Turbo Cancers) and urothelial carcinoma
- ovarian cancer (possible signal with mRNA Turbo Cancers)
- gastric cancer
- prostate cancer (possible signal with mRNA Turbo Cancers)
- Nasopharyngeal cancer

There is almost no literature on Ivermectin and lymphomas which are probably the most common COVID-19 mRNA vaccine turbo cancers – this must be investigated.

What Dose of Ivermectin to Treat COVID-19 mRNA Vaccine Turbo Cancer?

- Guzzo et al published a paper in 2022 on the "Safety, tolerability, and pharmacokinetics of escalating high doses of Ivermectin in healthy adult subjects"
- The highest dose tested to be safe with no side effects, was 2 mg/kg.
- Max concentration in plasma is 4 hours after oral intake
- Half life is 18 hours
- Dr.David E. Scheim PhD, Blacksburg VA also wrote an interesting article on Ivermectin Safety in Sep.7, 2021 (Source)
- Several studies have shown that Ivermectin's anti-cancer effects are DOSE-DEPENDENT (higher dose = better response)

Warning: not to be taken as medical advice – hypothetical situation: if I was faced with a COVID-19 Vaccine Induced Turbo Cancer or an advanced stage cancer, I would be looking at an Ivermectin dose of 2mg/kg orally, daily or every two days.

Dr. Justus Hope MD published an article on Aug.29, 2023 that discusses anecdotal cases of Stage 4 Colon cancer, Stage 4 Ovarian Cancer responding to Ivermectin with dramatic drop in Tumor markers.

Also mentioned is a “High Dose Ivermectin” regimen of 2mg/kg per day for a doctor with Stage 4 Gallbladder cancer, taken for over a year, with visual side effects for a few days initially which resolved.

Also described is a case of enlarged Prostate suspicious for cancer, and a 5 week Ivermectin 45mg/day regimen that dropped PSA from 89.1 to 10.9 with resolution of nocturnal urinary frequency. For a 100kg man, that is a dose of 0.45mg/kg, significantly lower than the 2 mg/kg safe dose published by Guzzo et al.

The article describes a cancer patient with a neck tumor and lung metastases on a High Dose Ivermectin regimen of 2.45mg/kg daily.

I believe that it is a reasonable hypothesis that COVID-19 mRNA Vaccine Turbo Cancer patients could benefit from High Dose Ivermectin regimens, such as 2mg/kg and we urgently need more research to be done in this area.

(mRNA Vaccine Induced Turbo Cancers such as leukemias, glioblastomas, breast cancers (including triple negative), colon cancers, hepatobiliary cancers, lung cancers, melanomas, renal cell cancers, ovarian cancers, prostate cancers – as there is already evidence in the literature)

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Dr. William Makis is a Canadian physician with expertise in Radiology, Oncology and Immunology. Governor General’s Medal, University of Toronto Scholar. Author of 100+ peer-reviewed medical publications.

The Worldwide Corona Crisis, Global Coup d'Etat Against Humanity

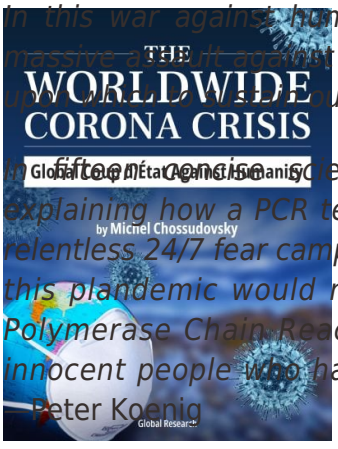
by Michel Chossudovsky

Michel Chossudovsky reviews in detail how this insidious project "destroys people's lives". He provides a comprehensive analysis of everything you need to know about the "pandemic" — from the medical dimensions to the economic and social repercussions, political underpinnings, and mental and psychological impacts.

"My objective as an author is to inform people worldwide and refute the official narrative which has been used as a justification to destabilize the economic and social fabric of entire countries, followed by the imposition of the "deadly" COVID-19 "vaccine". This crisis affects humanity in its entirety: almost 8 billion people. We stand in solidarity with our fellow human beings and our children worldwide. Truth is a powerful instrument."

Reviews

This is an in-depth resource of great interest if it is the wider perspective you are motivated to understand a little better, the author is very knowledgeable about geopolitics and this comes out in the way Covid is contextualized. —Dr. Mike Yeadon



In this war against humanity in which we find ourselves, in this singular, irregular and massive attack against liberty and the goodness of people, Chossudovsky's book is a rock upon which to base our fight. –Dr. Emanuel Garcia

In fifteen concise science-based chapters, Michel traces the false covid pandemic, explaining how a PCR test, producing up to 97% proven false positives, combined with a relentless 24/7 fear campaign, was able to create a worldwide panic-laden "plandemic"; that this plandemic would never have been possible without the infamous DNA-modifying Polymerase Chain Reaction test – which to this day is being pushed on a majority of innocent people who have no clue. His conclusions are evidenced by renown scientists. Peter Koenig

Professor Chossudovsky exposes the truth that "there is no causal relationship between the virus and economic variables." In other words, it was not COVID-19 but, rather, the deliberate implementation of the illogical, scientifically baseless lockdowns that caused the shutdown of the global economy. –David Skripac

A reading of Chossudovsky's book provides a comprehensive lesson in how there is a global coup d'état under way called "The Great Reset" that if not resisted and defeated by freedom

loving people everywhere will result in a dystopian future not yet imagined. Pass on this free gift from Professor Chossudovsky before it's too late. You will not find so much valuable information and analysis in one place. –Edward Curtin

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