Roundup/Glyphosate Dermal and Respiratory Exposure Studies on Humans and Animals

Gathered by the law offices of Baum, Hedlund, Arestei and Goldman
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https://www.baumhedlundlaw.com/pdf/monsanto-documents/johnson-trial/Johnson-Day-Twelve-A-7-26-18.pdf

This is a good primer on dermal absorption of glyphosate/Roundup – testimony from Dr. William Sawyer during the Johnson trial. Discussion of dermal absorption/Roundup formulation toxicity starts on page 3595.

"…glyphosate, based on animal test data, is carcinogenic by itself. However, **there are additives to the product which increase and enhance its carcinogenicity by several mechanisms**."

https://www.baumhedlundlaw.com/pdf/monsanto-documents/johnson-trial/PTX-0765-Glyphosate-Mouse-Skin-Study-2009.pdf

George study showed tumors on the skin of rodents following exposure to Roundup.

"The tumor promoting property of glyphosate, as observed in the present study, is in consistency with previous reports, where **glyphosate is reported to induce cell proliferation and interfere with cell cycle regulation.** These results confirmed that **glyphosate has tumor promoting activity**."

http://baumhedlundlaw.com/pdf/monsanto-documents/70-b-TNO-Study-on-Dermal-Absorption-Referenced-in-Email-Correspondence.pdf

In response to questions from European regulators, Monsanto retained TNO, a laboratory in Denmark, to conduct rat skin penetration studies using a Roundup formulated product. The TNO study revealed that **5% to 1 0% of the glyphosate in the Roundup formulation was dermally absorbed.** As these results were far higher than the information submitted to the EPA (Monsanto maintained only 3% absorption), Monsanto elected to immediately stop any further work with TNO as the results could

"blow Roundup risk evaluations," according to a Monsanto executive. The results of the TNO study were never submitted to EPA.

http://www.scielo.br/scielo.php?pid=S1415-47572007000300026&script=sci_arttext&tlng=pt

Paz-y-Miño studied the consequences of aerial spraying with glyphosate-based formulation in 24 exposed individuals (21 control) in Ecuador. The data showed a **higher degree of DNA damage in the exposed group compared to the control**, suggesting that the formulation used during aerial spraying glyphosate had a genotoxic effect.

https://www.ncbi.nlm.nih.gov/pubmed/19672767

Bolognesi studied the genotoxic risk of glyphosate in agricultural workers from within five Colombian regions. Four regions were sprayed for illicit crops and maturation of sugar cane. The control was an organic coffee farm. Blood was tested before the exposure, five days after spray and four months after spray. At the five-day point, there was a **significant increase in DNA damage in the blood samples of those who had been exposed**. If there was no repeated exposure, that damage normalized by the final blood reading four months later. **This study shows that repeated, chronic exposure to glyphosate leads to DNA damage, which ultimately can lead to cancer**.

https://www.baumhedlundlaw.com/pdf/monsanto-documents/Monsanto-Paper-Clustering-Glyphosate-Formulations-with-Regard-to-Testing-for-Dermal-Uptake.pdf

Monsanto's own paper on synergistic effect between glyphosate and surfactants…

"Surfactants are able to increase glyphosate absorption through the skin by (1) removal of lipids (sebum) from the epidermal surface due to surfactant action, (2) increase of the hydration state of the skin (under closed exposure conditions), (3) increase of skin contact (spreading of water droplets by surfactant action), (4) increase of contact time with the skin due to decrease of evaporation of water from the droplets containing surfactant (surfactant monolayer at surface of droplets slows down passage to vapour phase,) increase of sub epidermal blood flow due to irritant action of surfactant, (6) intraepidermal and sub epidermal intercellular water accumulation due to the irritant action of the surfactant."