

# Where the Rubber Meets the Road; Update on the NTP Crumb Rubber Research Program

**NTP Scientist:** Dr. Georgia K. Roberts, Program Operations Branch, DNTP, NIEHS

## Background Materials

- See footnotes
- NTP's website on the synthetic turf/recycled tire crumb rubber research program: <https://ntp.niehs.nih.gov/results/areas/syntheticurf/research.html>

## Overview

In recent years, public health concern for playing sports on synthetic turf fields has increased due to reports in the media of young adult soccer players being diagnosed with blood cancers. There are over 12,000 synthetic turf fields in the United States, with 1,200 added annually. Due to the recent rise in public health concern and expanding use of synthetic turf/crumb rubber, several efforts have been undertaken at the state<sup>1</sup> and federal<sup>2,3,4</sup> levels to identify knowledge gaps, characterize exposure scenarios and identify chemicals found in crumb rubber.

In November 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) nominated synthetic turf/crumb rubber to the NTP for testing and the NTP presented a preliminary approach to the Board of Scientific Counselors (BSC) in June 2016<sup>5,6,7</sup>. Based on feedback from the BSC, agency partners, and the public, NTP refined the research strategy and chemical characterization; in vitro and in vivo studies are currently ongoing. The NTP strategy considers potential routes of human exposure to crumb rubber and aims to understand what exposure conditions in an experimental laboratory setting have the potential to result in systemic exposure to crumb rubber constituents. An additional goal is to provide data to inform other researchers on the logistical constraints of various routes of exposure.

Commercial crumb rubber materials obtained from multiple sources were combined to prepare a single composite crumb rubber test material. Size fractionated material is being used for selected experiments. Test material characterization, including physical and chemical evaluation, will help to inform chemical analysis of biological samples from the in vitro and in vivo studies, as well as allow comparison of the NTP test material to samples collected as part of other efforts by OEHHA and federal agencies. In vitro testing will help to evaluate the

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<sup>1</sup> OEHHA website: <http://oehha.ca.gov/risk-assessment/synthetic-turf-studies>

<sup>2</sup> EPA website: <https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields>

<sup>3</sup> ATSDR website: <https://www.atsdr.cdc.gov/frap/index.html>

<sup>4</sup> CPSC website: <https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center>

<sup>5</sup> NTP Synthetic turf/crumb rubber research program (initial proposal):

[https://ntp.niehs.nih.gov/ntp/about\\_ntp/bsc/2016/june/meetingmaterials/turf\\_crumb-rubber\\_508.pdf](https://ntp.niehs.nih.gov/ntp/about_ntp/bsc/2016/june/meetingmaterials/turf_crumb-rubber_508.pdf)

<sup>6</sup> BSC presentation: [https://ntp.niehs.nih.gov/ntp/about\\_ntp/bsc/2016/june/presentations/turfc\\_rumb\\_508.pdf](https://ntp.niehs.nih.gov/ntp/about_ntp/bsc/2016/june/presentations/turfc_rumb_508.pdf)

<sup>7</sup> BSC minutes, pages 8-11: [https://ntp.niehs.nih.gov/ntp/about\\_ntp/bsc/2016/june/minutes201606\\_508.pdf](https://ntp.niehs.nih.gov/ntp/about_ntp/bsc/2016/june/minutes201606_508.pdf)

biological effects of bioaccessible crumb rubber constituents in a medium throughput assay, potentially allowing for read-across studies with additional test materials. The in vivo studies have been designed to assess the practicality of performing animal studies and determine what routes of exposure are most likely to result in systemic exposure.