National Survey of Precision Medicine in Cancer Treatment

Understanding provider experiences to inform the future of cancer care

A survey of the

NIH NATIONAL CANCER INSTITUTE

In collaboration with the

NATIONAL HUMAN GENOME RESEARCH INSTITUTE, NIH and the AMERICAN CANCER SOCIETY

Who is eligible for this survey?

This survey is intended for oncologists who have treated or evaluated patients with cancer, including hematologic malignancies and solid tumors. Have you treated or evaluated cancer patients in the past 12 months?

☐ **I have treated or evaluated cancer patients in the past 12 months** [Continue]

☐ **I have NOT treated or evaluated cancer patients in the past 12 months**

→ *[Please return blank survey in the envelope provided].*

SECTION A: YOUR PATIENT POPULATION

This questionnaire focuses on treatment and evaluation of patients with cancer, including hematologic malignancies and solid tumors.

For each question, please fill in one box ☒ or write in an answer as requested

A1. On average, how many unique patients do you see for evaluation or treatment each month? Your best estimate is fine.

☐☐☐ Total unique patients per month

A2. Of the total patients you see for evaluation or treatment each month, how many are cancer patients? Your best estimate is fine.

☐☐☐ Unique cancer patients per month

A3. On average, how many patients with **metastatic or recurrent cancers** do you see for evaluation or treatment **each month**? By metastatic, we mean cancer that has spread to other parts of the body. By recurrent, we mean cancer that has come back after a period of time during which the cancer could not be detected. Your best estimate is fine.

☐☐☐ Metastatic or recurrent cancer patients

A4. On average, how many unique patients with the following cancers do you see for evaluation or treatment each month?

(Please check one box in each row.)	None ▼	1-10 patients per month ▼	11-25 patients per month ▼	26+ patients per month ▼
a. Breast cancer	☐	☐	☐	☐
b. Colorectal cancer	☐	☐	☐	☐
c. Glioma	☐	☐	☐	☐
d. Gynecological cancer	☐	☐	☐	☐
e. Hematological cancer	☐	☐	☐	☐
f. Lung cancer	☐	☐	☐	☐
g. Melanoma	☐	☐	☐	☐
h. Stomach (Gastric) cancer	☐	☐	☐	☐
i. Other Solid Tumor	☐	☐	☐	☐

SECTION B: GENOMIC TESTING

This section asks about your use of genomic testing, which includes **single gene tests** for individual genes or chromosomal mutations and **multi-marker tumor panel testing** for multiple genes assessed for mutations, alterations, or expression that may provide clinically actionable information. When responding, please only consider tests for tumor tissue, not tests for germline or inherited cancer predisposition.

B1. For each of the following tests, how confident are you in your ability to determine whether the test i**s clinically appropriate** for a patient?

(Please check one box in each row.)	Not at all confident ▼	A little confident ▼	Moderately confident ▼	Very confident ▼
a. Commercially available multi-marker tumor panels (e.g., FoundationOne, Oncotype DX)	☐	☐	☐	☐
b. Non-commercial tumor panel performed at an academic medical center	☐	☐	☐	☐
c. Whole genome or exome sequencing	☐	☐	☐	☐
d. Tests for individual genes or chromosomal alterations (e.g., KRAS for colorectal cancer)	☐	☐	☐	☐

B2. For each of the following tests, how confident are you in your ability to use the results of the test to **guide decisions** about patient treatment and management?

(Please check one box in each row.)	Not at all confident ▼	A little confident ▼	Moderately confident ▼	Very confident ▼
a. Commercially available multi-marker tumor panels (e.g., FoundationOne, Oncotype DX)	☐	☐	☐	☐
b. Non-commercial tumor panel performed at an academic medical center	☐	☐	☐	☐
c. Whole genome or exome sequencing	☐	☐	☐	☐
d. Tests for individual genes or chromosomal alterations (e.g., KRAS for colorectal cancer)	☐	☐	☐	☐

B3. For each of the following tests, how confident are you in your ability to explain **the testing purpose and procedures** to a patient?

(Please check one box in each row.)	Not at all confident ▼	A little confident ▼	Moderately confident ▼	Very confident ▼
a. Commercially available multi-marker tumor panels (e.g., FoundationOne, Oncotype DX)	☐	☐	☐	☐
b. Non-commercial tumor panel performed at an academic medical center	☐	☐	☐	☐
c. Whole genome or exome sequencing	☐	☐	☐	☐
d. Tests for individual genes or chromosomal alterations (e.g., KRAS for colorectal cancer)	☐	☐	☐	☐

B4. In the **past 12 months,** when you or your staff discussed any form of genomic testing with your cancer patients or their families, how often did you discuss the likely costs of the testing and related treatment?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ Did not discuss genomic testing with patients in past 12 months

SECTION C: MULTI-MARKER TUMOR PANEL TESTING

Section C focuses on your use of and experience with **multi-marker tumor panels**. For this survey, a multi-marker tumor panel is defined as a test that allows multiple genes to be assessed for mutations, alterations, or expression that may provide clinically actionable information. When responding, please only consider tests for tumor tissue, not tests for germline or inherited cancer predisposition.

C1. How of many of your cancer patients received the following multi-marker tumor panels within the **past 12 months**? Please include tests that were ordered by other physicians and tests performed by pathology.

(Please check one box in each row.)	Not familiar with this test ▼	Familiar with this test, but not used in the past 12 months ▼	1-10 patients in the past 12 months ▼	11+ patients in the past 12 months ▼
a. Breast Cancer Index℠ (BioTheranostics)	☐	☐	☐	☐
b. CancerSELECT® or CancerComplete® (Personal Gene Diagnostics [PGDx])	☐	☐	☐	☐
c. Caris Molecular Intelligence® or Target Now™ (Caris Life Sciences®)	☐	☐	☐	☐
d. CGI Complete™ (Cancer Genetics Incorporated [CGI])	☐	☐	☐	☐
e. FoundationOne® (Foundation Medicine®)	☐	☐	☐	☐
f. FoundationOne® Heme (Foundation Medicine®)	☐	☐	☐	☐
g. FoundationACT™(Foundation Medicine®)	☐	☐	☐	☐
h. GPS Cancer™ (NantOmics)	☐	☐	☐	☐
i. Guardant360™ (Guardant Health)	☐	☐	☐	☐
j. Mammaprint® (Agendia®)	☐	☐	☐	☐
k. myPlan® Lung Cancer (Myriad®)	☐	☐	☐	☐
l. OmniSeq Comprehensive℠ (OmniSeq®)	☐	☐	☐	☐
m. Oncotype DX® Breast (Genomic Health®)	☐	☐	☐	☐
n. Oncotype DX® Colon (Genomic Health®)	☐	☐	☐	☐
o. OnkoSight™ Tumor Panels (GenPath Diagnostics)	☐	☐	☐	☐
p. Prosigna® (NanoString Technologies®)	☐	☐	☐	☐
q. Solid Tumor Mutation Panel (ARUP® Laboratories)	☐	☐	☐	☐
r. Non-commercial tumor panel performed at an academic medical center	☐	☐	☐	☐
s. Other (Please specify):	☐	☐	☐	☐

The next section asks additional questions about multi-marker tumor panels. For these questions, please **exclude** Oncotype DX testing.

C2. In the **past 12 months**, for what percentage of your patients receiving multi-marker tumor panels, **excluding** Oncotype DX testing, did you use the results to guide patient care decisions? Your best estimate is fine.

☐☐☐ % [If 0, go to **Question D1, page 7**]

C3. In the **past 12 months**, how often did you use the results from multi-marker tumor panels, **excluding** Oncotype DX testing, to guide care decisions when treating the following types of patients?

(Please check one box in each row.)	Did not see these patients	Never	Rarely	Sometimes	Often
a. Patients with an initial diagnosis of cancer	☐	☐	☐	☐	☐
b. Patients with advanced refractory disease	☐	☐	☐	☐	☐
c. Patients with rare cancers	☐	☐	☐	☐	☐
d. Patients with cancers of unknown origins	☐	☐	☐	☐	☐
e. Patients for whom there is an FDA-approved therapy associated with a companion diagnostic	☐	☐	☐	☐	☐
f. Patients in specific clinical trials that have a companion molecular test	☐	☐	☐	☐	☐

C4. In the **past 12 months**, how often have you used the results from multi-marker tumor panels, **excluding** Oncotype DX testing, for the following purposes?

(Please check one box in each row.)	Never	Rarely	Sometimes	Often
a. To guide the use of FDA-approved drugs	☐	☐	☐	☐
b. To help decide whether to use FDA-approved drugs for an off-label use	☐	☐	☐	☐
c. To provide diagnostic information	☐	☐	☐	☐
d. To provide prognostic information	☐	☐	☐	☐
e. To determine patient eligibility for clinical trials	☐	☐	☐	☐

C5. In the **past 12 months**, when you used the results of multi-marker tumor panels for your patients, **excluding** Oncotype DX testing, how often did you experience the following?

(Please check one box in each row.)	Never	Rarely	Sometimes	Often
a. The test results assisted in making a diagnosis	☐	☐	☐	☐
b. The test results helped to inform my treatment recommendations	☐	☐	☐	☐
c. The test results confirmed eligibility for a clinical trial	☐	☐	☐	☐
d. The test results provided important information on prognosis	☐	☐	☐	☐
e. The test results were helpful to patients or their families in understanding their disease and making decisions	☐	☐	☐	☐
f. The test results were conclusive, but not actionable	☐	☐	☐	☐
g. The test results were inconclusive	☐	☐	☐	☐
h. The test results were difficult to interpret	☐	☐	☐	☐

C6. In the **past 12 months**, when you ordered or requested multi-marker tumor panels for your patients, **excluding** Oncotype DX testing, how often did you experience the following?

(Please check one box in each row.)	Never	Rarely	Sometimes	Often	Don't Know
a. The recommended drugs based on test results were not covered by insurance	☐	☐	☐	☐	☐
b. Inadequate reimbursement was paid to physician or hospital	☐	☐	☐	☐	☐
c. Uncertainty as to whether the test was indicated for patient's clinical situation	☐	☐	☐	☐	☐
d. Long wait to receive tests results that caused a delay in making patient care decisions	☐	☐	☐	☐	☐
e. Patient reluctance because of concern that hereditary genetic abnormalities might be found	☐	☐	☐	☐	☐
f. Results indicated an inherited cancer predisposition (e.g., BRCA1/2 mutation)	☐	☐	☐	☐	☐

C7. In the **past 12 months**, how important was each of the following factors in your decision to use multi-marker tumor panels to make **treatment decisions** for your cancer patients?

(Please check one box in each row.)	Not at all important	A little important	Somewhat important	Very important
a. Availability of guidelines (e.g., ASCO, NCCN) for the test	☐	☐	☐	☐
b. Your familiarity with guidelines (e.g., ASCO, NCCN) for the test	☐	☐	☐	☐
c. Your formal education or training (e.g., residency/fellowship, CME, lecture or symposia) on the test	☐	☐	☐	☐
d. Past experience with the test	☐	☐	☐	☐
e. FDA approval of the test for the patient population being tested	☐	☐	☐	☐
f. Information about the test from test suppliers or company representatives	☐	☐	☐	☐

C8. In the **past 12 months**, how important was each of the following factors in your decision to use multi-marker tumor panels to make **treatment decisions** for your cancer patients?

(Please check one box in each row.)	Not at all important	A little important	Somewhat important	Very important
a. Performance characteristic of the test (e.g., positive predictive value, sensitivity, specificity)	☐	☐	☐	☐
b. Prevalence of genetic alterations among patients with a specific type of cancer	☐	☐	☐	☐
c. Ability of the test to predict clinical benefit of specific treatments	☐	☐	☐	☐
d. Ability of the test to predict toxicity of specific treatments	☐	☐	☐	☐
e. Ability of the test to provide prognostic information	☐	☐	☐	☐
f. Ability of the test to provide diagnostic information (e.g., for a cancer of unknown primary)	☐	☐	☐	☐

C9. In the **past 12 months**, how important was each of the following factors in your decision to use multi-marker tumor panels to make **treatment decisions** for your cancer patients?

(Please check one box in each row.)	Not at all important	A little important	Somewhat important	Very important
a. Patient or family preferences	☐	☐	☐	☐
b. Test is covered by patient's insurance	☐	☐	☐	☐
c. Treatment is covered by patient's insurance	☐	☐	☐	☐
d. Patient out-of-pocket expenses for testing	☐	☐	☐	☐
e. Patient out-of-pocket expenses for treatment	☐	☐	☐	☐

C10. In the **past 12 months**, what percentage of your cancer patients initiated a discussion with you about multi-marker tumor panels? Please include when a family member or other caregiver asked on the patient's behalf. Your best estimate is fine.

☐☐☐ %

Section D: More on Multi-Maker Tumor Panels

We have just a few more questions about multi-maker tumor panels.

D1. In the **past 12 months**, did you rely on any of the following to learn about using a new multi-marker tumor panel for cancer patients?

(Please check one box in each row.)	Yes	No
a. Informal networks (e.g., colleagues)	☐	☐
b. National or international experts	☐	☐
c. Testing laboratories or pathologists	☐	☐
d. Test manufacturers or drug company representatives or websites	☐	☐
e. FDA package inserts	☐	☐
f. Scientific meetings or conferences	☐	☐
g. Peer-reviewed medical literature	☐	☐
h. Medical professional societies such as ASCO or NCCN	☐	☐
i. Government (e.g., NIH) websites or materials	☐	☐
j. Foundation or cancer patient advocacy websites or materials	☐	☐
k. Evidence-based, synthesized websites (e.g., UpToDate)	☐	☐

D2. In the **past 12 months**, did you refer any of your cancer patients to another location or provider for a multi-marker tumor panel?

- ☐ Yes
- ☐ No → Go to **Question D4**

D3. In the **past 12 months**, did you refer any of your cancer patients to any of the following for a multi-marker tumor panel?

(Please check one box in each row.)	Yes	No
a. Academic medical center	☐	☐
b. Oncologist outside your practice	☐	☐
c. Clinical trial	☐	☐

D4. In the **past 12 months**, how many of your cancer patients presented with results from a commercially available multi-marker tumor test that was not ordered through you or your practice?

- ☐ None → Go to **D6, page 9**
- ☐ 1-10 patients
- ☐ 11-25 patients
- ☐ 26+ patients

D5. In the **past 12 months**, when patients presented with commercially available multi-marker tumor testing results that you did not order, did you take any of the following courses of action?

(Please check one box in each row.)	Yes	No
a. Consulted with your local Tumor Board	☐	☐
b. Consulted with a pathologist	☐	☐
c. Ordered additional single gene tests	☐	☐
d. Ordered additional multi-marker tumor tests	☐	☐
e. Referred to a cancer center	☐	☐
f. Used results to guide patient care decisions	☐	☐
g. Enrolled patient in a clinical trial	☐	☐

The following questions are about reasons why you decided not to conduct multi-marker tumor panel testing or barriers to testing that you encountered.

D6. The next question is about the times during the **past 12 months** when you decided NOT to order a multi-marker tumor panel for a cancer patient. When this occurred, how often was it for the following reasons?

(Please check one box in each row.)	Never	Rarely	Sometimes	Often
a. Multi-marker testing was not relevant for the patient	☐	☐	☐	☐
b. Used tests for individual genes, rather than multi-marker tumor panels	☐	☐	☐	☐
c. Not enough evidence of utility	☐	☐	☐	☐
d. Multi-marker panels were not available in my practice	☐	☐	☐	☐
e. Test was not covered by patient's insurance	☐	☐	☐	☐
f. Out-of-pocket costs for tests were too expensive for the patient	☐	☐	☐	☐
g. Provider reimbursement for tests was insufficient	☐	☐	☐	☐
h. Lack of personnel or resources to interpret test results	☐	☐	☐	☐
i. Uncertainty regarding informed consent procedures	☐	☐	☐	☐
j. Difficulty obtaining sufficient tissue for testing	☐	☐	☐	☐
k. Insufficient time to order tests or review results	☐	☐	☐	☐
l. Patient's or patient's family preferences	☐	☐	☐	☐

D7. In the **past 12 months,** how often, if at all, were the following barriers to involving your cancer patients or their families in the decision-making process for multi-marker tumor panels?

(Please check one box in each row.)	Never	Rarely	Sometimes	Often
a. Difficulty getting patient/family to understand the purpose of the test	☐	☐	☐	☐
b. Difficulty getting patient/family to understand treatment options	☐	☐	☐	☐
c. Lack of educational materials to share with patient/family	☐	☐	☐	☐
d. Insufficient time to discuss testing or treatment options with patient/family	☐	☐	☐	☐
e. Patient/family resistant to testing	☐	☐	☐	☐

SECTION E: ABOUT YOU AND YOUR PRACTICE

The next set of questions will help us to better understand you and your primary medical practice. By primary medical practice we mean the site where you see most of your cancer patients.

E1. Is your primary practice a ...

- ☐ Solo practice
- ☐ Single specialty group
- ☐ Multi-specialty group
- ☐ Other

E2. Including yourself, how many full- and part-time physicians are in your primary practice?

☐☐☐☐ Number

E3. How would you characterize your primary practice?

- ☐ Urban
- ☐ Suburban
- ☐ Rural

E4. Does your primary practice provide care for patients living in rural areas as part of an outreach or visiting clinician arrangement?

- ☐ Yes
- ☐ No

E5. Does your primary practice have the following genomic testing services?

(Please check one box in each row.)	Yes ▼	No ▼	Don't know ▼
On-site pathology	☐	☐	☐
Contracts with outside testing laboratories to perform tests not available on-site	☐	☐	☐
On-site genetic counselors	☐	☐	☐
Internal policies or protocols for use of genomic and biomarker testing	☐	☐	☐
An EMR that alerts providers when a genomic test is recommended for a particular patient or before ordering a particular drug	☐	☐	☐
Genomic/Molecular Tumor board	☐	☐	☐

E6. In the past 12 months what percentage of your patients were Medicare, Medicaid, and self-pay/uninsured?

☐☐☐ % Medicare

☐☐☐ % Medicaid

☐☐☐ % Self-pay/uninsured

E7. In which of the following practice settings do you see patients for treatment or evaluation?

(Please check all that apply)

- ☐ Academic medical center or medical school
- ☐ Medical center not affiliated with a medical school
- ☐ Community hospital
- ☐ Office-based
- ☐ HMO or integrated healthcare system
- ☐ Other

E8. Is your primary practice affiliated with an academic institution such as a medical school or teaching hospital? Do not include where your practice only has admissions privileges.

- ☐ Yes
- ☐ No

Lastly, we have just a few more questions about you and your background.

E9. What is your primary specialty? Please think about the one specialty in which you spend most of your time.

- ☐ Medical oncology
- ☐ Hematology
- ☐ Hematology/oncology
- ☐ Other

E10. Do you hold a faculty appointment or do you have a teaching assignment at a medical school or hospital?

- ☐ Yes
- ☐ No

E11. During a typical month, approximately what percentage of your professional time do you spend in the following activities?

☐☐☐ % Providing patient care

☐☐☐ % Teaching

E12. Have you received any formal training (e.g., instruction during residency/fellowship, professional lectures or seminars, symposiums, conferences, CMEs) in use of **genomic testing**?

- ☐ Yes
- ☐ No

E13. Which of these best describes your ethnicity?

(Choose one)

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Non-Latino

E14. Which of these best describes your race?

(Choose one or more)

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

Thank you for taking the time to complete this questionnaire. Your contribution is valuable to us. The information you have provided will be kept private and any information that could identify you will not be associated directly with the results.

Please return this questionnaire in the enclosed postage-paid return envelope or fax back to 1-800-647-9659.

If you have questions about this survey, please email us at PrecisionMedicine@rti.org or call us toll-free at 1-866-590-7469.

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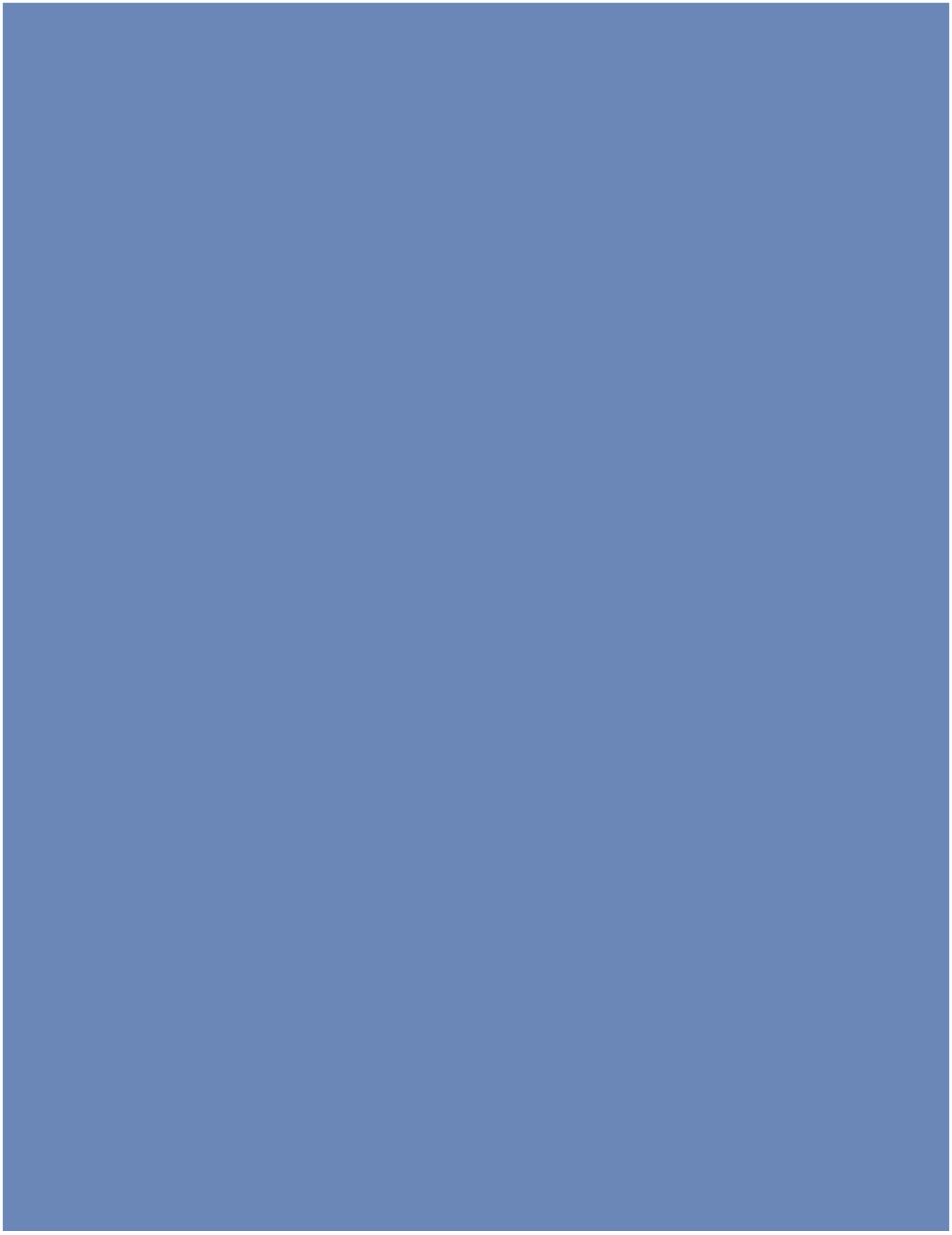
Collection of this information is authorized by The Public Health Service Act, Section 411 (42 USC 285a). Rights of study participants are protected by The Privacy Act of 1974. Participation is voluntary, and there are no penalties for not participating or withdrawing from the study at any time. Refusal to participate will not affect your benefits in any way. The information collected in this study will be kept private to the extent provided by law. Names and other identifiers will not appear in any report of the study. Information provided will be combined for all study participants and reported as summaries. You are being contacted by mail to complete this instrument so that we can understand how genomic testing results are used to inform cancer treatment.

Public reporting burden for this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: NIH, Project Clearance Branch, 6705 Rockledge Drive, MSC 7974, Bethesda, MD 20892-7974, ATTN: PRA (0925-0739). Do not return the completed form to this address.



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