

How To Design Your Custom NGS Panel

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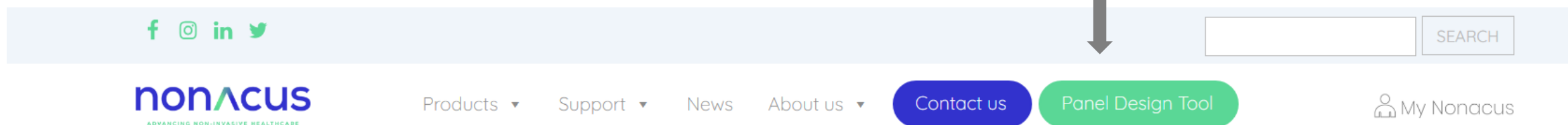
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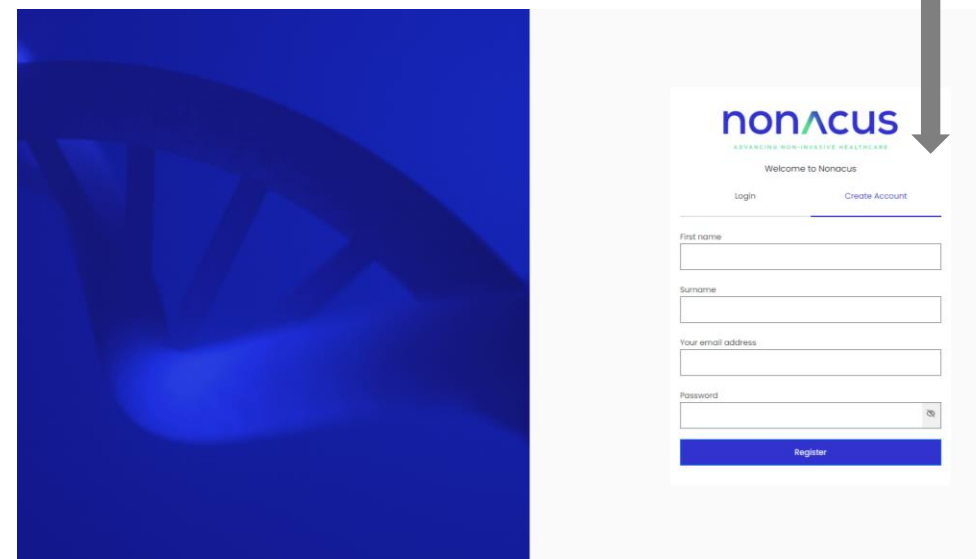
How to design your Custom NGS Panel

1. Create a Nonacus Account

- ^ Go to <https://www.nonacus.com/>
- ^ On the opening page click *Panel Design Tool* on the upper right



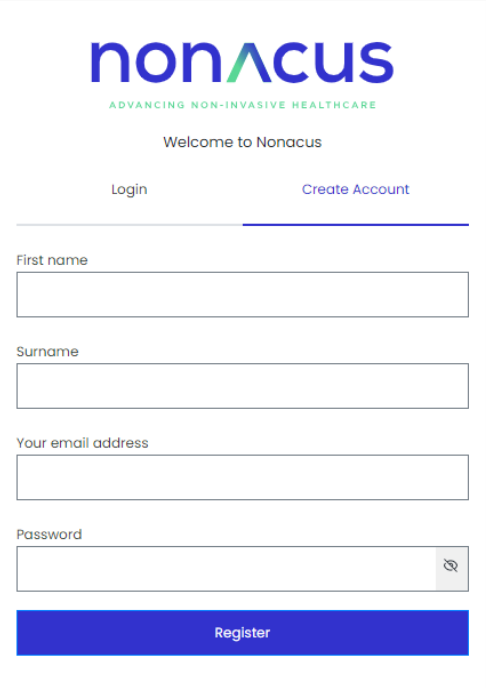
- ^ Or alternatively, go direct to <https://mynonacus.nonacus.com/>
- ^ Click 'Create Account'



How to design your Custom NGS Panel

1. Create a Nonacus Account

- ▲ Fill in First Name, Surname, professional email account, setup your own password and click Register

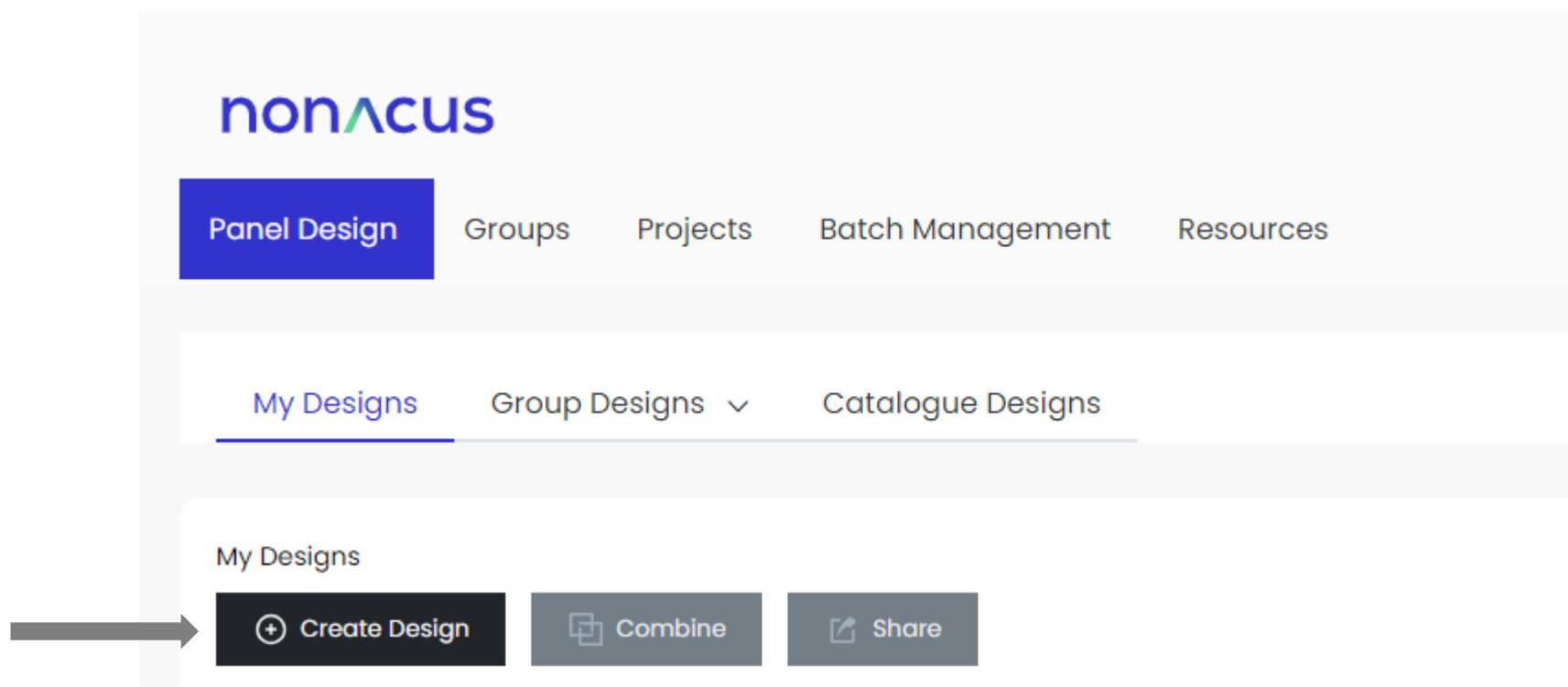


The image shows a registration form for Nonacus. At the top, the Nonacus logo is displayed with the tagline "ADVANCING NON-INVASIVE HEALTHCARE". Below the logo, it says "Welcome to Nonacus". There are two links: "Login" and "Create Account", with "Create Account" being the active link. The form contains four input fields: "First name", "Surname", "Your email address", and "Password". The "Password" field has a toggle icon for visibility. At the bottom of the form is a blue "Register" button.

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2. Create your own Custom NGS Panel

- ^ After registration, click *Login*, enter your email address, password and click *Continue*
- ^ On the Nonacus Probe Design Tool page, click *Create Design*



How to design your Custom NGS Panel

2. Overview of the 'Create Panel Design' page

Create Panel Design ✕

1 Advanced Sets

2 Name*

3 Select Genome*

GRCh37 **GRCh38**

4 Tiling*

2x

5 Input Type*

Bed List Gene List Template

6 Include

Exome

7 Gap Fill ⓘ

8 Repeat Masking

9 Input Bed File*

No file added

Click [here](#) to download an example

↑

1. 'Advanced' setting provides more tiling options if required.
2. Name your panel
3. Select the Genome Option (GRCh37 or GRCh38)
4. Tiling sets the preferred probe alignment/overlap
5. Select Input Type: BED list, Gene List or Template ('Template' allows a mix of genes and regions in a design).
6. Selecting Exome will choose validated probes from the Nonacus exome, that are appropriate for the Genes/Regions specified
7. Selecting Gap Fill will utilise validated probes from the Nonacus exome in drop out/masked regions.
8. Repeat Masking will mask difficult to target repetitive regions
9. Browse your input file

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3. Create a Panel Design using a BED file

Create Panel Design ✕

Advanced Sets

Name*

Select Genome*

Tiling*

Input Type*

Include

Exome

Gap Fill ⓘ

Repeat Masking

Input Bed File*

No file added

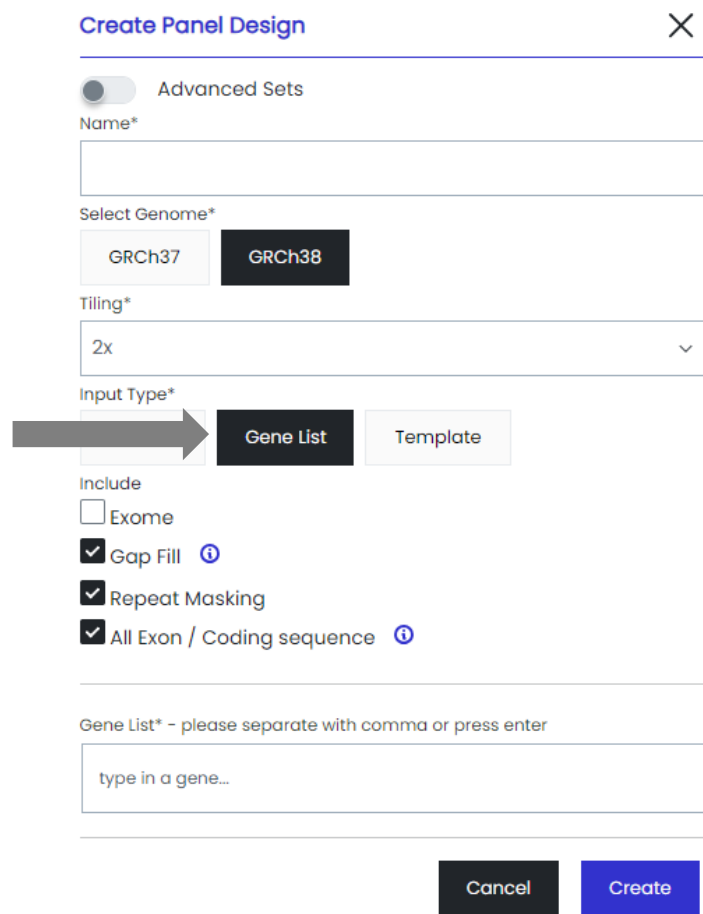
Click [here](#) to download an example

- ^ Name your panel
- ^ Select the Genome Option (GRCh37 or GRCh38)
- ^ Select the preferred tiling
- ^ Select Input Type: BED list
- ^ Browse the file to upload it and click Create
- ^ Note: Click [here](#) to download an example of a BED file

The design will be validated and an email will be sent explaining the next steps.

How to design your Custom NGS Panel

4. Create a Panel Design using a Gene List



Create Panel Design ✕

Advanced Sets

Name*

Select Genome*

Tiling*

Input Type*

Include

Exome

Gap Fill ⓘ

Repeat Masking

All Exon / Coding sequence ⓘ

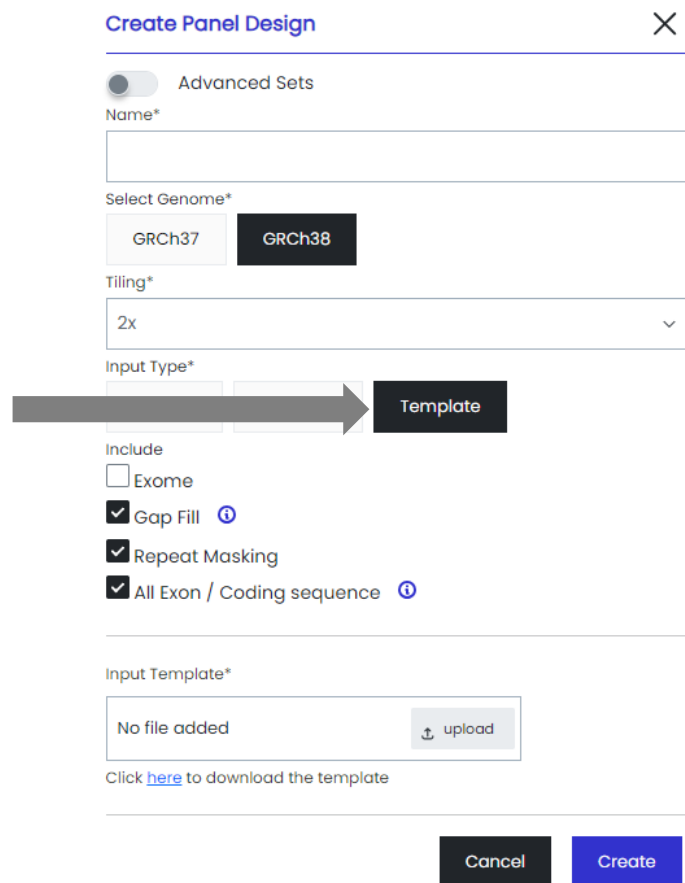
Gene List* - please separate with comma or press enter

- ^ Name your panel
- ^ Select the Genome Option (GRCh37 or GRCh38)
- ^ Select the preferred tiling
- ^ Select Input Type: Gene List
- ^ All Exon/Coding sequence: Select this toggle for coding sequence only, de-select for all exons including 3' and 5' untranslated regions
- ^ Enter your list of genes in the Gene list box, one per line
- ^ Click Add

The design will be validated and an email will be sent explaining the next steps.

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5. Create a Panel Design using a Template File



Create Panel Design ✕

Advanced Sets

Name*

Select Genome*

Tiling*

Input Type*

Include

Exome

Gap Fill ⓘ

Repeat Masking

All Exon / Coding sequence ⓘ

Input Template*

Click [here](#) to download the template

A template file lets you specify a mixture of gene and regions in one file, enabling an easy way to specify sophisticated custom panels.

- ^ Name your panel
- ^ Select the Genome Option (GRCh37 or GRCh38)
- ^ Select the preferred tiling
- ^ Select Input Type: Template
- ^ All Exon/Coding sequence: Select this toggle for coding sequence, de-select for all exons including untranslated region
- ^ Browse the file to upload it and click *Add*

Note: Click *here* to download an example of a Template file

The design will be validated and a notification email will be sent explaining the next steps.

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6. Downloading your Panel Design stats

Each panel design generates 3 BED files; covered regions, non-covered and target regions and a 'design stats' PDF which shows target coverage and probe information.

The screenshot shows the nonACUS web interface. At the top, there's a navigation bar with 'Panel Design' selected. Below it, there are tabs for 'My Designs', 'Group Designs', and 'Catalogue Designs'. The 'My Designs' section contains a table with columns: Select, ID, Name, Input Type, Genome, Tiling, Exome, Gap Fill, Created, and Action. A red circle '1' highlights the 'Select' column, and a red circle '2' highlights the 'Action' column. A dropdown menu is open over the 'Action' column for the first row, showing options: Request Help, Download, Request Quote, Share, and Delete. The 'Download' option is highlighted.

Select	ID	Name	Input Type	Genome	Tiling	Exome	Gap Fill	Created	Action
<input type="checkbox"/>	1939	AF2 - RefSeq	Bed List	GRCh38	2x	×	✓	24/04/2023 13:11:21	⋮
<input type="checkbox"/>	1938	AF1 - coding 16-17	Bed List	GRCh38	2x	×	✓	24/04/2023 13:10:12	⋮
<input type="checkbox"/>	1931	HRD_HRR_combined_v2	Bed List	GRCh37	2x	×	✓	21/04/2023 10:43:41	⋮
<input type="checkbox"/>	1550	Panel for NKI	Gene List	GRCh38	2x	×	✓	09/11/2022 14:26:22	⋮
<input type="checkbox"/>	1546	Panel for Jitendra Badhai (NKI)	Gene List	GRCh38	2x	×	✓	08/11/2022 14:20:16	⋮

DESIGN REPORT

DESIGN INFORMATION

Design ID: XXXX
 Design Name: XXXXXXXX
 Genome Build: GRCh38

TARGET INFORMATION

Total Target Size (bp): XXXX
 Number of Merged targets: XX

PROBE INFORMATION

Total Number of Probes: XXX
 Total Covered Region (bp):
 XXXXXX
 Total Covered (%): 100.0
 Total Not Covered (%): 0.0

1. Find the panel you wish to view the design stats for
2. Click the Actions ellipsis '...' and choose Download. Files will be downloaded to your 'Downloads' folder

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7. How to create a group to share your panel designs

The screenshot shows the nonACUS web interface with the 'Groups' tab selected. A modal dialog titled 'Add Group' is open, containing the following fields and buttons:

- Group name***: A text input field with a green circle '3' next to it.
- Group description**: A text input field.
- Invite member(s)**: A text input field with the placeholder 'type in an email...' and a green circle '4' next to it.
- Buttons**: 'Cancel' and 'Add' buttons at the bottom right, with a green circle '5' next to the 'Add' button.

The background interface shows a list of groups with columns for 'Group Name', 'Software Group', and 'Members'. A green circle '1' is next to the 'Groups' tab, and a green circle '2' is next to the 'Add New Group' button.

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1. Select the Groups tab
2. Click on 'Add new group'
3. Give your group a name
4. Add each member's email address
5. Click 'Add'

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7. How to share your panel designs

The screenshot shows the nonACUS interface with the 'Share with' dialog box open. The dialog box is titled 'Share with' and has a close button (X) in the top right corner. It contains a search bar, a list of groups, and a 'Share' button. The groups listed are: 'Andy, Tim, Rob' (selected with a checkmark), 'COL002-NPD-GOA-PatientSpecificPanels-MO', 'NPD013-PanCancer', and 'Software Group'. There is also an option to 'Create New Group'. The 'Share' button is highlighted with a green circle 4. The background shows the 'My Designs' table with a 'Share' button highlighted with a green circle 2. The first row of the table is selected with a checkmark and a green circle 1.

Select	ID	Name	Gene List	GRCh38	2x	Gap Fill	Created	Action
<input checked="" type="checkbox"/>	1939	AF2 - RefSeq				✓	24/04/2023 13:11:21	⋮
<input type="checkbox"/>	1938	AF1 - coding 16-17				✓	24/04/2023 13:10:12	⋮
<input type="checkbox"/>	1931	HRD_HRR_combined_v2				✓	21/04/2023 10:43:41	⋮
<input type="checkbox"/>	1550	Panel for NKI				✓	09/11/2022 14:26:22	⋮
<input type="checkbox"/>	1546	Panel for Jitendra Badhai (NKI)				✓	08/11/2022 14:20:16	⋮

1. Select the panel(s) you wish to share
2. Click the share button
3. Select the group(s) you wish to share with
4. Click 'Save'

An email will be sent to all the members of the group notifying them that a panel has been shared with them.

Q: Why has my design failed?

A: You may have entered an incorrect gene name (please check you are using NCI naming convention), if you entered a gene list, make sure its in the right format – ie a list not in a line. If none of these work, please contact tech support: support@nonacus.com

Q: How do I find out how well the design covers my regions?

A: A pdf file called 'design stats' which contains information about your panel including percentage coverage can be downloaded by clicking the Actions ellipsis associated with your panel.

Q: My coverage is less than 100% how do I find out which regions are missing?

A: Download the BED file labelled 'covered' for your panel design. The BED file can be found by clicking the Actions ellipsis associated with your panel.

Q: I have some really important regions missing from my design – how can I get these covered?

A: Our design algorithm automatically masks highly repetitive regions of the genome to improve panel success and prevent excess capture and sequencing cost associated with these regions. If you have a region important to your work that is being masked and preventing probe design across that region, please contact technical support (support@nonacus.com) who can help you improve coverage.

Q: How much will my panel cost?

A: You can request a quote by clicking the Actions ellipsis associated with your panel. We price panels based on the number of probes in the panel:

Catalogue number	Product Description	Number of probes
C3448CU	Cell3™ Target: Custom Panel, Tier 1 (48 samples)	10,000
C3496CU	Cell3™ Target: Custom Panel, Tier 1 (96 samples)	10,000
C3548CU	Cell3™ Target: Custom Panel, Tier 2 (48 samples)	20,000
C3596CU	Cell3™ Target: Custom Panel, Tier 2 (96 samples)	20,000
C3648CU	Cell3™ Target: Custom Panel, Tier 3 (48 samples)	50,000
C3696CU	Cell3™ Target: Custom Panel, Tier 3 (96 samples)	50,000
C3748CU	Cell3™ Target: Custom Panel, Tier 4 (48 samples)	100,000
C3796CU	Cell3™ Target: Custom Panel, Tier 4 (96 samples)	100,000

nonAcus

ADVANCING NON-INVASIVE HEALTHCARE

