

Security Class

Holder Account Number

Fold

Form of Proxy - Annual and Special Meeting to be held on June 1, 2021

This Form of Proxy is solicited by and on behalf of Management.

Notes to proxy

1. Every holder has the right to appoint some other person or company of their choice, who need not be a holder, to attend and act on their behalf at the meeting or any adjournment or postponement thereof. If you wish to appoint a person or company other than the Management Nominees whose names are printed herein, please insert the name of your chosen proxyholder in the space provided (see reverse).
2. If the securities are registered in the name of more than one owner (for example, joint ownership, trustees, executors, etc.), then all those registered should sign this proxy. If you are voting on behalf of a corporation or another individual you may be required to provide documentation evidencing your power to sign this proxy with signing capacity stated.
3. This proxy should be signed in the exact manner as the name(s) appear(s) on the proxy.
4. If a date is not inserted in the space provided on the reverse of this proxy, it will be deemed to bear the date on which it was mailed to the holder by Management.
5. The securities represented by this proxy will be voted as directed by the holder, however, if such a direction is not made in respect of any matter, and the proxy appoints the Management Nominees listed on the reverse, this proxy will be voted as recommended by Management.
6. The securities represented by this proxy will be voted in favour, or withheld from voting, or voted against each of the matters described herein, as applicable, in accordance with the instructions of the holder, on any ballot that may be called for. If you have specified a choice with respect to any matter to be acted on, the securities will be voted accordingly.
7. This proxy confers discretionary authority in respect of amendments or variations to matters identified in the Notice of Meeting and Management Information Circular or other matters that may properly come before the meeting or any adjournment or postponement thereof, unless prohibited by law.
8. This proxy should be read in conjunction with the accompanying documentation provided by Management.

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Proxies submitted must be received by 5:00 pm, Eastern Daylight Time, on May 28, 2021.

VOTE USING THE TELEPHONE OR INTERNET 24 HOURS A DAY 7 DAYS A WEEK!



To Vote Using the Telephone

- Call the number listed BELOW from a touch tone telephone.

1-866-732-VOTE (8683) Toll Free



To Vote Using the Internet

- Go to the following web site: www.investorvote.com
- **Smartphone?** Scan the QR code to vote now.



To Receive Documents Electronically

- You can enroll to receive future securityholder communications electronically by visiting www.investorcentre.com.



To Virtually Attend the Meeting

- You can attend the meeting virtually by visiting the URL provided on the back of this proxy.

If you vote by telephone or the Internet, DO NOT mail back this proxy.

Voting by mail may be the only method for securities held in the name of a corporation or securities being voted on behalf of another individual.

Voting by mail or by Internet are the only methods by which a holder may appoint a person as proxyholder other than the Management Nominees named on the reverse of this proxy. Instead of mailing this proxy, you may choose one of the two voting methods outlined above to vote this proxy.

To vote by telephone or the Internet, you will need to provide your CONTROL NUMBER listed below.

CONTROL NUMBER



Appointment of Proxyholder

I/We being holder(s) of securities of Aptose Biosciences Inc. (the "Corporation") hereby appoint: William G. Rice, or failing this person, Jotin Marango (the "Management Nominees")

OR

Print the name of the person you are appointing if this person is someone other than the Management Nominees listed herein.

Note: If completing the appointment box above YOU MUST go to <http://www.computershare.com/aptose> and provide Computershare with the name and email address of the person you are appointing. Computershare will use this information ONLY to provide the appointee with a user name to gain entry to the online meeting.

as my/our proxyholder with full power of substitution and to attend, act and to vote for and on behalf of the holder in accordance with the following direction (or if no directions have been given, as the proxyholder sees fit) and on all other matters that may properly come before the Annual and Special Meeting of shareholders of the Corporation to be held online at <https://web.lumiagm.com/408550733> on June 1, 2021 at 10:00 am, Pacific Daylight Time (the "Meeting") and at any adjournment or postponement thereof.

VOTING RECOMMENDATIONS ARE INDICATED BY **HIGHLIGHTED TEXT** OVER THE BOXES.

1. Election of Directors

	For	Withhold		For	Withhold		For	Withhold
01. Carol Ashe	<input type="checkbox"/>	<input type="checkbox"/>	02. Dr. Denis Burger	<input type="checkbox"/>	<input type="checkbox"/>	03. Caroline M. Loewy	<input type="checkbox"/>	<input type="checkbox"/>
04. Dr. Eric Platzler	<input type="checkbox"/>	<input type="checkbox"/>	05. Dr. William G. Rice	<input type="checkbox"/>	<input type="checkbox"/>	06. Dr. Mark D. Vincent	<input type="checkbox"/>	<input type="checkbox"/>
07. Warren Whitehead	<input type="checkbox"/>	<input type="checkbox"/>						

For **Against** **Abstain**

2. Appointment of Auditors

Appointment of KPMG, LLP as the independent accounting firm for the Corporation.

For **Against** **Abstain**

3. Adoption of 2021 Stock Incentive Plan

Resolution authorizing the adoption of the Corporation's 2021 stock incentive plan.

For **Against** **Abstain**

4. Adoption of 2021 Employee Stock Purchase Plan

Resolution authorizing the adoption of the Corporation's 2021 employee stock purchase plan.

For **Against** **Abstain**

5. Say-on-Pay

Advisory (non-binding) resolution on the compensation of the Corporation's named executive officers.

1 Year **2 Years** **3 Years**

6. Frequency of Say-on-Pay Votes

Advisory (non-binding) resolution on the frequency of future "say on pay" votes.

Signature of Proxyholder

Signature(s)

Date

I/We authorize you to act in accordance with my/our instructions set out above. I/We hereby revoke any proxy previously given with respect to the Meeting. **If no voting instructions are indicated above, and the proxy appoints the Management Nominees, this Proxy will be voted as recommended by Management.**

MM / DD / YY

Interim Financial Statements – Mark this box if you would like to receive Interim Financial Statements and accompanying Management's Discussion and Analysis by mail.

Annual Financial Statements – Mark this box if you would NOT like to receive the Annual Financial Statements and accompanying Management's Discussion and Analysis by mail.

If you are not mailing back your proxy, you may register online to receive the above financial report(s) by mail at www.computershare.com/maillinglist.

